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COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

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COVER: Of approximately 160 species of fish marketed in the United States, most are suitable in one or more types of diets: low sodium, high protein, high or low fat, and easily digested. Fishery products, good for anyone, can be used for variety of flavor and texture in diet-planning for all age groups: baby, child, teen-ager, young adult, adult, and elderly people. Low in calories and high in well-balanced protein for growth promotion, fishery products contain a high percentage of the minimum daily requirements of most vitamins, as well as essential minerals. (See pp. 7-16 of this issue.)

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FREEZING AND STORING DEEP-SEA LOBSTERS-- SOME TESTS ON COOKED WHOLE LOBSTERS

By Joseph W. Slavin* and John A. Peters**

ABSTRACT

IT WAS FOUND THAT DEEP-SEA LOBSTERS, COOKED ALIVE AND THEN FROZEN IN A BLAST-AIR FREEZER OR IN AN IMMERSION FREEZER (IN A GLUCOSE-SALT SOLUTION), COULD BE KEPT SATISFACTORILY IN FROZEN STORAGE FOR 2 TO 4 WEEKS.

BECAUSE OF THE LIMITED FROZEN SHELF LIFE OF THE DEEP-SEA LOBSTER, IT WOULD NOT BE FEASIBLE TO MARKET FROZEN WHOLE LOBSTERS IN THE NORMAL CHAIN OF DISTRIBUTION. IT WOULD BE POSSIBLE, HOWEVER, TO FREEZE THEM AT SEA AND THEN DISTRIBUTE THEM TO LOBSTER PRODUCERS OR TO RESTAURANTS WHERE A RAPID TURN-OVER OCCURS. THE USE OF A BLAST OR IMMERSION FREEZER IS DISCUSSED, AND RECOMMENDATIONS ARE GIVEN FOR SELECTING A FREEZING SYSTEM TO HANDLE LOBSTERS ON A VESSEL.

INTRODUCTION

Because of the problems in keeping deep-sea lobsters alive aboard commercial fishing trawlers, the lobster resource found off the coast of Massachusetts by the U. S. Bureau of Commercial Fisheries research vessel Delaware has not been adequately exploited. Accordingly, information on a satisfactory method of preserving lobsters at sea would contribute to greater utilization of this fishery.

Keeping deep-sea lobsters alive aboard commercial fishing vessels presents the following problems: (1) the high cost of equipping the vessel with the tanks and pumps necessary to provide the required storage space and sea-water circulation and (2) the high mortality rate of lobsters at certain times of the year in spite of precautions taken to outfit the vessel properly.

Possible solution to these problems would be to freeze the cooked^{1/} whole lobsters aboard the vessel in either a blast or immersion freezer, since this equipment is well suited for freezing irregularly shaped products and can easily be installed on a fishing vessel. Information on the storage life of cooked, frozen, whole lobsters is also necessary in order to enable industry to decide if it would be feasible to market these lobsters.

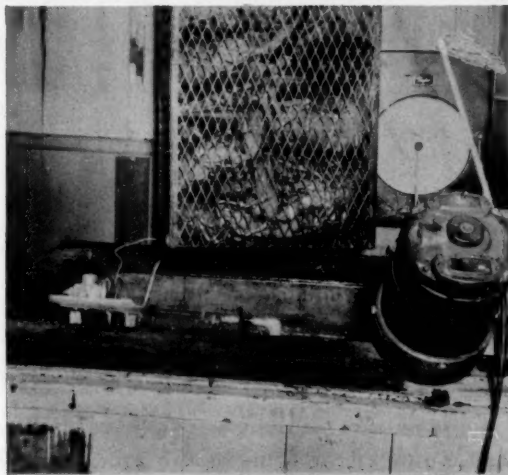


FIG. 1 - LOWERING THE BASKET OF LOBSTERS INTO THE FREEZING SOLUTION.

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^{1/}EARLIER TESTS ON FROZEN LOBSTERS (POTTINGER 1950) SHOWED THAT WHEN WHOLE FROZEN UNCOOKED LOBSTERS WERE COOKED, THE MEAT STUCK VERY TIGHTLY TO THE SHELL AND WAS EXTREMELY DIFFICULT TO REMOVE. IN THE PRESENT EXPERIMENT, THE LOBSTERS THEREFORE WERE COOKED PRIOR TO FREEZING.

OBJECTIVES

The objectives of the present study, which was conducted on a pilot-plant scale, therefore were as follows:

1. To determine the freezing rates and requirements for freezing cooked whole deep-sea lobsters aboard a fishing vessel in (a) an immersion freezer or in (b) a blast freezer.
2. To determine the keeping quality of deep-sea lobsters that are frozen in an immersion freezer or in a blast freezer and that are subsequently stored, unpackaged, at 0° F.^{2/}

PROCEDURE

The lobsters used in this test were caught by the Bureau's trawler Delaware on the southeast part of Georges Bank in about 200 fathoms of water. They were kept alive on the vessel in a tank supplied with circulating sea water. After the lobsters were unloaded from the vessel, they were trucked to a local lobster pool, where again a tank of circulating sea water kept them alive.

PREPARING THE LOBSTERS FOR FREEZING: The live lobsters were cooked in boiling sea water, in a large wooden tank, for 30 minutes. They then were removed from the tank and allowed to cool in air before being frozen.

FREEZING OF COOKED DEEP-SEA LOBSTERS: The cooked lobsters were divided into two separate lots of approximately 50 pounds each. One lot was frozen in the laboratory immersion freezer and the other in the laboratory blast freezer.

Immersion Freezing: DESCRIPTION OF FREEZER: The immersion freezer consisted of a rectangular galvanized steel tank with a capacity of 800 pounds of water. The tank was 30 inches long by 30 inches wide by 30 inches deep and, with the exception of a suitable opening on top, was covered with 4 inches of cork insulation on the outside. The insulation was covered with 1-inch-thick tongue-and-groove fir sheathing.



FIG. 2 - BUTCHERING THE THAWED LOBSTERS IN ORDER TO REMOVE THE MEAT FOR TASTE-PANEL TESTS.

baffle allowed the brine to flow around the cooling coils and the product during freezing. Expansion of the Freon-12 refrigerant through the pipe coils provided the necessary cooling effect. Adequate circulation of the freezing medium was maintained by a $\frac{1}{2}$ hp. laboratory-type mixer.

^{2/}PREVIOUS STUDIES ON LOBSTERS BY THE BOSTON FISHERY TECHNOLOGICAL LABORATORY HAVE BEEN CONCERNED WITH THE FREEZING AND STORING OF LOBSTER MEAT PACKED IN CANS. RESULTS OF THESE STUDIES INDICATE THAT IF PROPER CONTROL OF FROZEN-STORAGE TIME AND TEMPERATURE ARE MAINTAINED, IT WILL BE FEASIBLE TO MARKET THE FROZEN CANNED PRODUCT (PETERS AND SLAVIN 1958).

The refrigeration equipment consisted of a $1\frac{1}{2}$ horsepower Freon-12 air-cooled condensing unit (capacity 6,800 British Thermal Units (B.T.U.) per hour at -15° F. refrigerant suction temperature) connected to two expansion valves, an evaporator consisting of four banks of copper pipe coils, and the necessary auxiliary units. The total effective cooling surface area was 22 square feet. The evaporator was located within a section of the freezing tank that was separated from the product-freezing area by a wooden baffle. Openings at both ends of the

A basket constructed of $\frac{1}{2}$ -inch flattened expanded metal, hot dip galvanized, 24 inches deep by 18 inches long by 12 inches wide, having a hinged opening at the top, was used to hold the lobsters during freezing.

PREPARATION OF THE FREEZING SOLUTION: The solution used as a freezing medium consisted of corn-syrup solids^{3/} (34 percent by weight) and salt (NaCl--12 percent by weight) dissolved in tap water. In the preparation of the solution, 540 pounds of water were put into the immersion freezing tank. Then 340 pounds of corn-syrup solids and 120 pounds of salt pellets, referred to in the trade as "brine buttons," were added. The mixture was agitated with the laboratory mixer. After the corn-syrup solids and salt had dissolved, which required 5 hours, the refrigeration equipment was started, and the solution was cooled to 3° F.

FREEZING THE LOBSTERS: The basket used to hold the lobsters during freezing had 3 cubic feet of usable space. A ratio of about 17 pounds of lobsters per cubic foot of basket space was used to prevent the lobsters from packing together and restricting the flow of the glucose-salt solution over them during freezing.^{4/}

Ten lobsters, totaling 50 pounds in weight, were placed in the basket. Copper-constantan thermocouples were inserted into the center of the tail muscle of three of these lobsters, and one thermocouple was put into the glucose-salt solution. The basket containing the lobsters then was lowered into the solution (fig. 1). During freezing, the temperatures of the lobsters were recorded by means of a multipoint recording potentiometer. After the lobsters had been cooled to 6° F., they were removed from the freezer, and the excess solution was allowed to drain off. Finally, the frozen lobsters were transferred to a wooden box and put in a 0° F. commercial-type cold-storage room.

Blast Freezer: DESCRIPTION OF THE FREEZER: The freezer used was similar to many low-temperature blast freezers found in commercial freezing plants. The refrigeration equipment consisted of a 25-hp., two-stage, Freon 22, water-cooled condensing unit (capacity 36,000 B.T.U. per hour at -40° F. refrigerant suction temperature), a finned-pipe coil evaporator, and the necessary auxiliary units. A flow of air at high velocity was provided by a 2 hp. centrifugal fan having a capacity of 6,000 cubic feet per minute.

The evaporator and fan were within the insulated freezing room. This equipment was located above the product-freezing chamber and separated from it by a horizontal baffle. Suitable openings in the baffle allowed for circulation of cold air, at a high velocity, through the product-freezing space.

FREEZING THE LOBSTERS: Eleven cooked whole lobsters, weighing about 50 pounds, were placed in a single layer on an expanded metal shelf of the freezer truck. The shelf was arranged so that cold air at a high velocity could circulate over and under the layer of lobsters. Copper-constantan thermocouples were placed in the center of the tail muscle of three of the lobsters, and one thermocouple was placed so as to be in the stream of cold air. The truck containing the lobsters then was wheeled into the blast-freezer room, which had been precooled to -11° F. The temperatures of the lobsters and of the air circulating over the lobsters were recorded on a multipoint recording potentiometer during freezing. After the lobsters had been cooled to 3° F., they were removed from the blast freezer, transferred to a wooden box, and put in storage at 0° F., with the immersion-frozen lobsters.

PREPARATION OF THE LOBSTERS FOR TASTE-PANEL EVALUATION: Prior to each taste test, two blast-frozen and two immersion-frozen lobsters were re-

^{3/}THE CORN SYRUP SOLIDS IS A COMMERCIAL ACID HYDROLYSATE OF CORN STARCH. FORTY-TWO PERCENT OF THE SOLIDS IS EQUIVALENT TO DEXTROSE (GLUCOSE), AND THE REMAINDER CONSISTS OF 2- TO 6-MOLECULE DEXTROSE POLYMERS.

^{4/}SLAVIN (1956) REPORTED THAT IN THE IMMERSION FREEZING OF FISH MORE THAN 20 POUNDS OF FISH PER CUBIC FOOT OF SPACE RESULTS IN PACKING. PRELIMINARY TESTS SHOWED THAT THE RATIO OF PRODUCT TO SPACE FOR FREEZING LOBSTERS WAS SIMILAR TO THAT FOR FISH.

moved from the 0° F. storage room and allowed to thaw for 18 hours in a 35° F. chill room. The meat then was removed from the tails and claws and was cut into pieces for serving to the taste-panel (fig. 2). The control sample used in the taste tests was obtained from a local lobster dealer and consisted of meat picked from inshore lobsters that had been cooked alive on the day of the examination.

The taste-panel, consisting of 6 to 8 members of the laboratory staff, graded the thawed lobster meat for appearance, odor, flavor, and mixture.

RESULTS AND DISCUSSION

FREEZING OF DEEP-SEA LOBSTERS: The freezing rates of deep-sea lobsters (average weight 5 pounds) in an immersion freezer and in a blast freezer are shown in figure 3. These curves show that lobsters immersion-frozen in a 4° F. glucose-salt solution were cooled from 74° F. to 6° F. in 120 minutes and that blast-frozen lobsters were cooled from 80° F. to 6° F. in 128 minutes, indicating that very little difference existed in the time required to cool the two lots of lobsters to 6° F. The immersion-frozen lobsters were cooled to 10° F. at a much faster rate, however, than were the blast-frozen lobsters. The slower cooling of the immersion-frozen lobsters, from 10° F. to 6° F. (the temperature at which they were removed from the freezer) was due to the small temperature difference between the lobsters and the glucose-salt solution. If all of the lobsters were frozen to 10° F. instead of 6° F., which might well occur in commercial operation, only 90 minutes would be required to immersion-freeze lobsters, whereas 126 minutes would be required to blast-freeze lobsters of the same size.

The curves in figure 3 also show that during freezing, the glucose-salt solution was at an average temperature of about 4° F., whereas the cold air circulating over the lobsters in the blast freezer ranged from -10° F. to -34° F. (These temperatures are representative of those used commercially for blast freezing fish.) The refrigerant evaporative temperatures for both the blast and the immersion freezers were 15° F. lower than were the temperatures of the respective cooling media. Slavin (1956) reported that as the refrigerant evaporative temperature decreases, the efficiency of the refrigeration compressor also decreases. The lower evaporative temperature at which the blast-freezer compressor operated therefore also resulted in decreased operating efficiency. The lower operating efficiency of the blast-freezer compressor, the additional compressor capacity required because of the heat given off by the blast-air fan, and the electrical energy necessary to operate the blast-air fan indicate that it would be more costly to freeze a given quantity of lobsters in a blast freezer than in an immersion freezer. Accordingly, the use of an immersion freezer should be seriously considered for freezing deep-sea lobsters aboard the vessel.

STORAGE OF FROZEN LOBSTERS: Table 1 shows the results of the examinations of the lobster meat obtained from the blast-frozen and immersion-frozen lob-

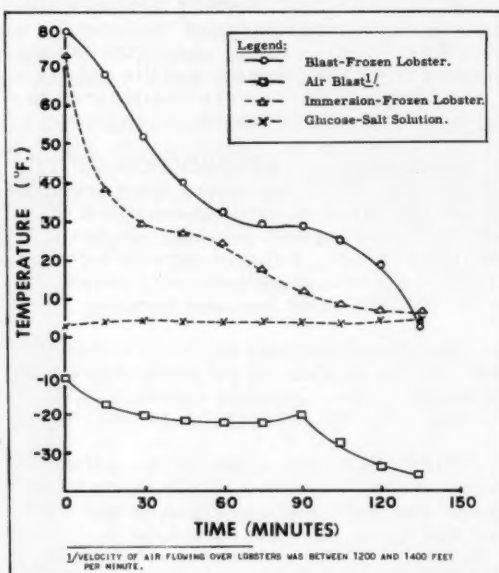


FIG. 3 - FREEZING RATE OF COOKED WHOLE LOBSTERS.

sters. After 2 weeks of storage at 0° F., the meat was of fair-to-good quality, and no signs of deterioration could be detected. After 4 weeks, however, the tips of the claws had developed a yellow color and had a slightly rancid odor. The rancidity had not affected the claw meat as a whole, but the rancid sections would have to be trimmed off before the meat could be marketed. By the end of 8 weeks of storage, the rancidity had increased to such a stage that the lobsters were considered unmarketable.

Since yellowing and rancidity appear during the third and fourth week of storage at 0° F., we therefore recommend that frozen cooked whole lobsters should not be stored at 0° F. longer than 2 weeks, if possible, and certainly no longer than 4 weeks.

Table 1 - Results of Examinations of Blast-Frozen and of Immersion-Frozen Whole Cooked Deep-Sea Lobsters

Sample	Storage Time at 0° F.	Quality of Thawed Lobster Meat Removed from: ^{1/}							
		Claws				Tail Section			
		Appearance	Odor	Flavor	Texture	Appearance	Odor	Flavor	Texture
Blast-frozen lobsters	Weeks								
	0	Good	Very good	Fair	Fair	Very good	Very good	Fair	Good
	2	Good	Very good	Very good	Good	Good	Very good	Very good	Good
	4	Tips yellow Body good	Tips slightly rancid Body fair	2/ 4/ Borderline	Borderline	Good	Fair	Borderline	Borderline
	8	Tips yellow Body good	Tips moder- ately rancid Body fair	2/ Borderline	Borderline	Good	Good	Good	Good
Immersion-frozen lobsters	0	Good	Very good	Fair	Fair	Good	Good	Fair	Fair
	2	Good	Good	Fair	Fair	Good	Very good	Fair	Fair
	4	Tips yellow Body good	Tips slightly rancid Body good	2/ Fair	Fair	Good	Fair	Fair	Fair
	8	Tips yellow Body good	Tips moder- ately rancid Body fair	2/ Borderline	Borderline	Borderline	Borderline	Borderline	Fair
Fresh control	0 ^{3/}	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

^{1/}THE GRADES OF QUALITY ARE BASED ON THE AVERAGE SCORES RECEIVED FROM A TASTE PANEL OF 6 TO 8 MEMBERS.

^{2/}TIPS OF CLAWS WERE REMOVED BEFORE THE CLAWS WERE SERVED TO THE TASTE PANEL.

^{3/}LOBSTER MEAT OBTAINED FROM IMMERSION LOBSTERS COOKED ALIVE ON THE DAY OF THE TASTE-PANEL EXAMINATION.

^{4/}THE TERM "BORDERLINE" INDICATES THAT THE QUALITY IS BETWEEN SLIGHTLY POOR AND FAIR AND IS OF MINIMUM ACCEPTABILITY.

INDUSTRY APPLICATION

Our study on freezing and storing whole cooked lobsters shows (1) that deep-sea lobsters can be frozen on board a fishing vessel in either an immersion freezer, using a glucose-salt solution, or in a blast freezer and (2) that they can be satisfactorily stored, unpackaged, at 0° F. for 2 to 4 weeks.

This information indicates that it would be feasible to freeze lobsters at sea if they can be marketed within 2 to 4 weeks after being frozen. Because of the very limited keeping quality of the frozen lobsters, it would not be feasible to market them in chain stores. It might be possible, however, to distribute frozen whole lobsters to a large producer of lobster food products or to restaurants, where a rapid turnover is possible.

An immersion freezer would be preferred over a blast freezer for use on the vessel because of the low space requirements, rapid freezing, and efficiency of operation. Commercial equipment is available for freezing lobsters at sea. The capacity of equipment employed would depend on the size of the vessel and on the anticipated catch.

SUMMARY

A pilot-plant study was conducted to simulate conditions that would occur aboard a commercial fishing vessel equipped to freeze lobsters at sea. The investigations concerned the freezing of whole cooked lobsters in an immersion freezer (glucose-

salt solution) and in a blast freezer. Information on the freezing rates and keeping quality of immersion and blast-frozen lobsters, stored at 0° F. was obtained. Results of the study show that cooked whole lobsters frozen in a glucose-salt solution at an average temperature of 4° F. were cooled to 10° F. faster than were lobsters that were frozen in a blast freezer having an air temperature of -10° F. to -34° F. Lobsters, immersion- or blast-frozen, were stored satisfactorily at 0° F. for 2 to 4 weeks.

Information presented in the report indicates that an immersion freezer would be more satisfactory for freezing lobsters aboard a fishing vessel than would a blast freezer and that it would not be possible to market whole frozen lobsters in chain stores because of the limited storage life. It might be possible, however, to distribute frozen lobsters to large producers of lobster food products or to restaurants that have a rapid turnover.

LITERATURE CITED

- PETERS, JOHN A. AND SLAVIN, JOSEPH W.
1958. TECHNICAL NOTE NO. 42 - KEEPING QUALITY AND RATE OF FREEZING OF COOKED DEEP-SEA LOBSTER MEAT FROZEN IN CANS, COMMERCIAL FISHERIES REVIEW, VOL. 20, NO. 1 (JANUARY), PP. 22-27. (SEPARATE NO. 499).
1956. NEW TECHNIQUES FOR FREEZING AND STORING NORTH ATLANTIC LOBSTERS, COMMERCIAL FISHERIES REVIEW, VOL. 18, NO. 7 (JULY), PP. 22-23. (SEPARATE NO. 443.)
- POTTINGER, S. R.
1950. TECHNICAL NOTE NO. 7 - RESULTS OF SOME TESTS WITH FROZEN LOBSTERS AND LOBSTER MEAT. COMMERCIAL FISHERIES REVIEW, VOL. 12, NO. 11 (NOVEMBER), PP. 31-33. (SEPARATE NO. 268.)
- SLAVIN, JOSEPH W.
1956. BRINE COOLING OF FISH ABOARD A FISHING VESSEL. INDUSTRIAL REFRIGERATION, VOL. 131, NO. 4 (OCTOBER), PP. 30, 32, AND 34.

NOTE: IF YOU ARE INTERESTED IN FREEZING LOBSTERS AT SEA, CONTACT THE BUREAU OF COMMERCIAL FISHERIES TECHNOLOGICAL LABORATORY AT EAST BOSTON, MASS., FOR PARTICULARS REGARDING SELECTION OF EQUIPMENT, COSTS OF CONVERTING YOUR VESSEL, AND CATCHES OF LOBSTERS THAT YOU CAN EXPECT.



LARGEST FISH

The three largest fish-like animals in the sea are all sharks. The largest is the whale shark which attains a length of 50 feet or more and a weight of several tons. It is an offshore species which feeds primarily on small organisms and is consequently harmless to man. The basking shark and the white shark are next in size. Both grow to be 40 feet or more and attain a weight of several tons. The basking shark, like the whale shark, is considered harmless. The white shark, however, is extremely dangerous. Fortunately, this shark is an offshore species, but its visits to inshore waters may be accompanied by shark attacks on man. Its occurrence in inshore waters is very sporadic, except along the coasts of Australia and Venezuela and, to a lesser degree, California.

In the Caspian Sea the large beluga or sturgeon attains a length of 30 feet and a weight of more than 4,000 pounds. Among the bony fishes, both the black and blue marlin approach 2,000 pounds in commercial catches, well above rod-and-reel records.

--"Sea Secrets," January 1958, The
International Oceanographic Foundation,
Miami, Fla.

NUTRITIONAL VALUE OF FISH IN REFERENCE TO ATHEROSCLEROSIS AND CURRENT DIETARY RESEARCH

By Charles Butler*

ABSTRACT

THERE IS MUCH IN TODAY'S NEWS ABOUT ATHEROSCLEROSIS, A DISORDER ARISING FROM THE DEPOSITION OF FATTY DEPOSITS, INCLUDING CHOLESTEROL, IN THE ARTERIES THAT SUPPLY BLOOD TO THE HEART. IN THE UNITED STATES ATHEROSCLEROSIS IS PRESENTLY THE CAUSE OF APPROXIMATELY ONE-THIRD OF THE TOTAL DEATHS OF MEN OVER 45 YEARS OF AGE. ALTHOUGH THERE IS NO AGREEMENT ON THE CAUSES FOR THIS DISEASE, IT DOES SEEM TO BE OF METABOLIC ORIGIN WITH A DEFICIENCY, EXCESS, OR IMBALANCE OF DIET POSSIBLY PLAYING AN OBSCURE ROLE IN RELATION TO DISTURBED LIPID METABOLISM.

FISH AND FISHERY PRODUCTS OFFER A NUMBER OF DEMONSTRATED NUTRITIVE MERITS IN THIS OR OTHER DISEASES THAT EVIDENCE NUTRITIONAL IMPLICATIONS. AMONG THESE FEATURES ARE: COMPLETE AND WELL-BALANCED PROTEIN; EASE OF DIGESTION; UNIQUE FORTIFICATION WITH UNSATURATED FATTY ACIDS; AND WIDE CHOICE IN FAT CONTENT, IN SPECIES (SPECIFIC FLAVORS AND TEXTURES), AND IN MARKET FORM SO THAT EYE AND APETITE APPEAL NEED NOT BE SACRIFICED TO COMPLY WITH A STRICT DIETARY REGIMEN.

RESEARCH NOW UNDER WAY WILL ACCURATELY PINPOINT WHICH OF THE UNSATURATED FATTY ACIDS ARE PRESENT IN FISH OILS, INDICATE THE DEGREE OF ESSENTIALITY OF EACH OF THESE ACIDS IN FAT METABOLISM, AND THROW FURTHER LIGHT ON THE EFFECTS OF INCLUSION OF THESE FATTY ACIDS IN THE DIET ON THE DEPOSITION OF CHOLESTROL IN THE ARTERIES.

A SERIES OF TABLES ARE INCLUDED SHOWING THE CHOLESTEROL CONTENT OF SOME PROTEIN FOODS, THE DISTRIBUTION OF UNSATURATED FATTY ACIDS IN A FISH OIL, THE UNSATURATED FATTY ACID COMPOSITION OF OILS DERIVED FROM SOME MARINE-ANIMALS, LAND-ANIMALS, AND VEGETABLES, AS WELL AS THE PROXIMATE COMPOSITION FOR SOME SPECIES OF MARINE AND FRESH-WATER FISH, SHELLFISH, AND CRUSTACEA.

In relationship to diet, you hear much these days about arteriosclerosis, atherosclerosis, and coronary heart disease. As Samuel Johnson would say, these are "foot-and-a-half words." What do they mean?

Arteriosclerosis is a general term for any of the many forms of hardening of the arteries.

Atherosclerosis is hardening of the coronary arteries through waxy deposits. It therefore is one type of arteriosclerosis.

Coronary heart disease is a disorder in which fatty deposits form in the arteries that supply blood to the heart. The deposits result in constriction in the artery. If the process continues and the deposits harden, the artery then becomes constricted very considerably. In later stages of the disease, a blood clot may lodge in the artery and further impede the flow of blood. Coronary thrombosis then results.

	ADAPTABILITY TO DIETS							
	TRACE MINERALS	HIGH VITAMINS	LOW CARBO- HYDRATES	LOW SODIUM	LOW FAT	HIGH PROTEIN	EARLY DIGESTIBLE	HIGH ENERGY
HADDOCK								
OC. PERCH								
SALMON								
MULLET								
HALIBUT								
TUNA								
SHRIMP								
OYSTERS								

FIG. 1 - SHOWS THE ADAPTABILITY OF VARIOUS TYPES OF FISH AND SHELLFISH TO DIETS.

TWO VIEWPOINTS

Beyond this point, you can get an argument on almost any aspect of the problem of atherosclerosis. Let's look at two of the opposing views for further background.

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MECHANICAL INJURY: One group contends that atherosclerosis occurs more often and more markedly in areas of stress induced within the artery injured by pressure of blood flow. Such injury may sensitize the tissues to biochemical action that weakens them and allows further mechanical injury.

A biochemical agent that weakens the tissues could be (1) a normal food ingredient not properly absorbed or excreted, (2) toxic products ingested or allowed to accumulate because of bodily imbalance, or (3) normally assimilable materials that for some reason build up in the blood above normal levels.

CHOLESTEROL DEPOSITS: Another group contends that atherosclerosis results from cholesterol becoming abnormally deposited in the arterial walls along with other lipids (fatty materials), protein, and ultimately, minerals.

Table 1 - Cholesterol Content of Some Protein Foods 1/

Food	Portion Size	Cholesterol Content
	Ounces	Grams 2/
Fish:		
Bluefish	4	.07
Cod	4	.06
Croaker	4	.07
Flounder	4	.072
Haddock	4	.077
Halibut	4	.072
Herring, smoked	4	.07
Lobster, canned	1 cup	.104
Mackerel, Atlantic	4	.096
Salmon, Pacific	4	.11
Salmon, canned	3	.11
Sardines (Atlantic), canned in oil, drained	3	.085
Shrimp, dry-pack, drained	3	.18
Swordfish	4	.07
Tuna, canned in oil, drained	3	.063
Tuna, drained	3	.063
Cheese:		
Roquefort	1	.027
Cheddar	4	.032
Edam	4	.018
Swiss	4	.043
Cream	4	.036
Cottage (skim-milk)	4	.002
Eggs:		
Whole	Medium egg (54 g.)	.30
White	-	.00
Yolk	-	.30
Beef:		
Hamburger	4	.14
Round steak	4	.15
Rib roast	4	.352
Liver	4	.12
Pork:		
Bacon	1 strip (8 g.)	.008
Ham	4	.07
Chop	3	.11
Frankfurter	3.5	.07
Veal:		
Cutlet	4	.075
Shoulder roast	4	.11
Leg roast	4	.168
Chicken:		
Canned	4	.085
Fryers (breast)	4	.085
(leg)	4	.08
Milk:		
Whole	one cup	.033
Nonfat	one cup	.001

1/ DATA OBTAINED FROM U.S.D.A. HANDBOOK NO. 8, COMPOSITION OF FOODS, PP. 92-147.

2/ 28.3 GRAMS EQUALS ONE OUNCE.

1/ DATA OBTAINED FROM U.S.D.A. HANDBOOK NO. 8, COMPOSITION OF FOODS, PP. 92-147.

2/ 28.3 GRAMS EQUALS ONE OUNCE.

Cholesterol is a part of the unsaponifiable fraction of fats and oils along with the fat-soluble vitamins A and D, squalene, and a number of the pigments or "color-bodies" of the fat. Fish oil may contain from 1 to 2 percent of unsaponifiable matter of which 20 to 25 percent in turn may be cholesterol or about 0.2 to 0.5 percent of the total fish oil. Obviously, cholesterol is a very minor constituent of fish oils. Some foods, such as eggs, contain rather more of it. Table 1 shows the cholesterol content for a serving portion of several protein foods.

Among the factors studied by the many workers in this field, that were believed might affect the cholesterol level of blood, were sex, age, racial origin, economic status, body weight, build, obesity or leanness, hormonal balance, composition of diet, and stress. The effects of these factors as measured on test animals, indicate that no conclusive statements can yet be made on any one aspect of atherosclerosis. We are, however, gaining a better concept of the problem. In May 1957, Dr. Wendall Griffith of the University of California Medical Center, while reporting to the American Medical Association, summarized the present state of our knowledge as follows:

"Considerable evidence exists to show that under certain circumstances, sources of linoleic acid may lower elevated blood-serum cholesterol levels in man. The evidence favors the concept that essential unsaturated fatty acids are required for normal transport of cholesterol as lipoprotein and possibly phospholipid complexes in the circulatory system. Circumstances under which high cholesterol levels can be prevented remain to be spelled out. No valid

experiments have yet shown the relative effects of surplus dietary calories, of an excess of the total dietary fat, of abnormal ratios of linoleic acid to other fatty acids in the diet, or of numerous other nutritive factors that may influence adversely the physical and chemical characteristics of fatty substances in the blood and in the walls of the vascular system.

Lacking a clearcut solution for prevention of atherosclerosis, a faulty diet may be one of the causative agents. The role of dietary fat remains to be established. Meanwhile, dietary control to attain and maintain optimum body weight and the choosing of a varied diet containing adequate amounts of those foods, including fats, that are shown to have special nutritive value is indicated."

ATHEROSCLEROSIS AND THE MARKETING OF FISH

What are the implications of our knowledge of atherosclerosis (although admittedly inconclusive) as it applies to the marketing of fish? If there is any agreement relating to atherosclerosis, at this stage, it is that this disorder is of metabolic origin--with a deficiency, excess, or imbalance of diet possibly playing an obscure role in relation to disturbed lipid metabolism.

POSSIBLE BOOMERANG: As Dr. E. Geiger of Van Camp Seafoods Laboratory cogently put it, we can suggest what does not help. He says, in substance, that attempts to exploit preliminary reports may do more harm than good. Earlier, for example, we were told to avoid such cholesterol-containing foods as eggs and the land-animal fats. Next fat-free diets were pushed. Then saturated fats were suspect. Soon the thinking veered to "essential"

fatty acids as being the more important of the fats in the diet. Dr. Geiger pointedly indicated that the heart authority who early recommended against canned fish for victims of coronary disease must have regretted this recommendation when the ideas

on importance of essential fatty acids and unsaturated oils, both present in canned tuna, for example, came to the fore. Thus during this period of exploratory medical research, any seeking of temporary advantage may boomerang.

GOOD STRATEGY: It would seem that a good, long-range strategy would be to push aggressively the more extensive use of fish. Some of the well-establish-

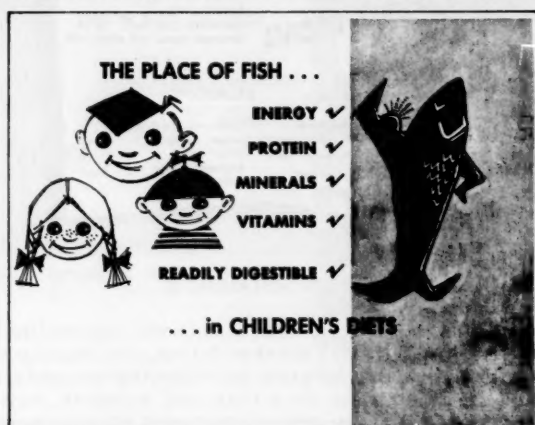


FIG. 2 - FISHERY PRODUCTS POSSESS THE IMPORTANT ELEMENTS NECESSARY FOR CHILDREN'S DIETS.

Table 2 - Unsaturated Fatty Acids in Pilchard Oils^{1/}

Example of Fatty Acid	Carbon Atoms	Double Bonds	Amount in Oil Percent
	No.	No.	Percent
Palmitoleic	16	1	12
Oleic	18	1	6
Linoleic	18	2	12
Arachidonic	20	4	18
Clupanodonic	22	5	14
Tetracosapolyenoic	24	?	15
			77

^{1/} FROM DATA COMPILED BY E. F. DREW AND COMPANY, INC., NEW YORK 10, NEW YORK.

and fishery products on demonstrated nutritive merits. Some of the well-established facts are pertinent here.

1. We know that fish are an excellent source of complete and well-balanced protein, essential to optimum nutrition.
2. We know that fish are easily digested and become readily available for assimilation, even for those in convalescence, for children, or for the aged.

3. We know that fish can be prepared with all these desirable qualities, but with very low sodium content, if that feature is essential, as it may be in cases of high blood pressure. Recently, Dr. Claude Thurston of the Bureau's Seattle Laboratory found that pink salmon can be made even more desirable for this purpose by the removal of the dark meat, which he found to contain a disproportionately high amount of sodium.

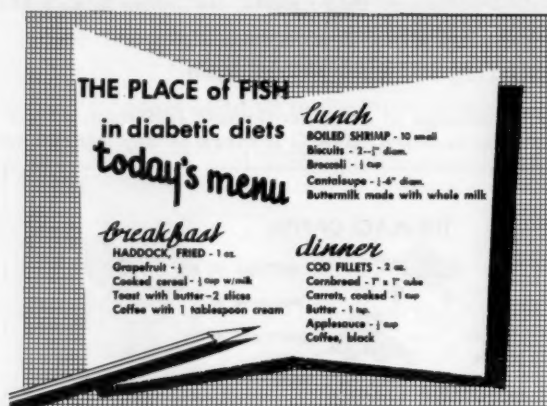


FIG. 3 - DIABETIC DIETS INCLUDE FISHERY PRODUCTS TO GOOD ADVANTAGE.

4. We know that fish oils are uniquely well fortified with more of the unsaturated fatty acids than are vegetable fats or land-animal fats. There is also some evidence that fish fat is easily digested and readily used by the body tissues. Table 2 shows the distribution of the principal unsaturated fatty acids in pilchard oil. At present, those fatty acids tentatively classed as being essential include linoleic, linolenic, and arachidonic.

5. We know that fish, within the approximately 160 marketed varieties and the numerous additional market forms, can supply to the diet any degree of fat desired, whether it be that of such oily species as sablefish, pilchard, or mackerel; that of such species as the very lean cod, haddock, halibut, or shrimp; or that of the numerous intermediate group composed of such species as salmon, tuna, oysters, crab, lobster, yellow perch, or flounder.

Thus, proof already is at hand showing that fish is an excellent food, regardless of the outcome of the additional studies now being conducted on the problem of atherosclerosis.

It should be pointed out, in passing, that this demonstrated value of fish may be applied to the greater utilization of fish in other areas of disease or malnutrition not specifically touched on here. The well-deserved position gained for fish-liver oils as a source of vitamins A and D is not necessarily an isolated case.

OUR KNOWLEDGE MUST CONTINUE TO GROW: Whatever the outcome of continuing worldwide research, we should be alert to benefit from the findings. By corollary, however, it is essential that our presently-limited knowledge of the nutritive value of fish and, specifically, of those factors of greatest importance in current dietary research must continue to grow along with the knowledge being gained in the field of competing products if we are to keep pace. Additional efforts could actually put us ahead, since we are working with products of great merit.

Dr. Stare, of the Department of Nutrition, Harvard University, aptly sums up the situation for this phase of the atherosclerosis discussion, thusly:

"As a final word, we should like to leave the impression that nutritional researches in this important area of health are most promising, and we are enthusiastic about them. But, we think that such enthusiasm should be directed toward further research, to get the many answers we don't have, rather than toward suggesting changes in our accustomed diets, when we aren't too sure at this time, if, or how they should be changed."

FUNDAMENTAL RESEARCH AND THE SALE OF FISH

This summation logically leads us into the third phase of our problem--what, specifically, is being done in our research program that will be of effective help?

As was stated earlier, we know that fish oils contain a larger amount and a greater diversity of the unsaturated fatty acids than do many other food fats. This information is one of the findings of fundamental technological fishery research begun with funds provided by the Saltonstall-Kennedy Act. The elucidation of the detailed chemical structure of the fatty acids in menhaden oil is now far enough along to predict that fish oils generally possess these unique characteristics. The characterization of other principal fish oils soon will be possible, using the methods developed in this study. There is no reason to expect more than the usual minor variability among species that have a comparable oil content, such as menhaden, sardines, and mackerel. For purposes of comparison, table 3 is a compilation showing the unsaturated fatty acid composition of land-animal fats and marine-animal fats and of vegetable oils.

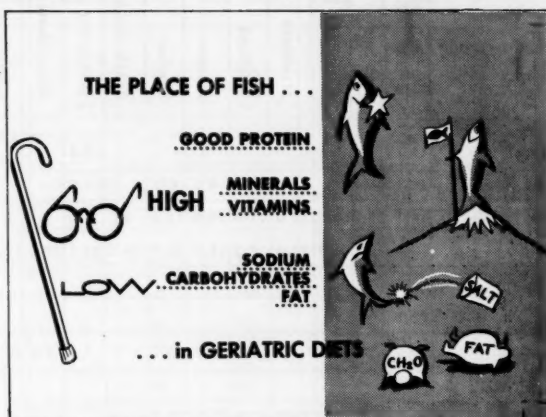


FIG. 4 - FISHERY PRODUCTS ARE IDEAL FOR GERIATRIC DIETS.

LIPOPROTEINS AND PHOSPHOLIPIDS: As a follow-up to a study of the physical-chemical characteristics of all commercially-produced fish oils, we now are setting up a study of the lipoproteins and phospholipids in fish oils. From statements made here, you will recall that these two phases of fat transport and metabolism in the body are believed to be a part of the atherosclerosis problem still unsolved.

DEPOSITION OF CHOLESTEROL: Again, you will recall that there is the unresolved problem of the deposition of cholesterol in the body. A new project now under way will include fish-oil fatty acids of known degrees of unsaturation in the diets of miniature pigs to follow the location and extent of deposition of cholesterol in the arteries. (The metabolism of pigs has been found to be similar to that of human beings. Use of miniature pigs reduces the cost of feeding and, therefore, of experimentation.) Ultimately, the pigs will be butchered, and their arteries examined to evaluate the effects of the several diets employed.

ESSENTIAL FATTY ACIDS: Another phase of this study is related again to the earlier remark about "essential" fatty acids. The diets of rats are set up (1) to throw further light on which of the several fatty acids are actually essential, (2) to determine whether their beneficial effects are available in fish oils, and (3) to point the way to the significance of these factors in human nutrition and in the related areas of human diseases.

UNSAAPONIFIABLE COMPONENTS: Still another phase will include the study of the values of another portion of fish oil--the unsaponifiable matter--for pharmaceutical and nutritive purposes. Certain of the unsaponifiable components of fish oil, for example, have been vaguely referred to in the scientific literature as being

Table 4 - Composition of Some Marine Fishes^{1/}

Common Name	Scientific Name	Range of Protein	Range of Oil	Sodium	Potassium	Thiamine	Riboflavin	Niacin
		(Percent)				(Mg./100 g. ^{2/})		
Anglerfish	<i>Lophius piscatorius</i>	8.8-12.4	0.5-4.5	-	-	-	-	-
Bluefish	<i>Pomatomus saltatrix</i>	-	-	-	-	0.12	0.09	1.9
Butterfish	<i>Poronotus triacanthus</i>	16.2-18.2	7.6-22.2	-	-	-	-	-
Cod	<i>Gadus morhua</i>	16.9-19.2	0.23-1.1	76	372	0.06-90	0.09-50	2.2
Croaker	<i>Micropogon undulatus</i>	-	-	-	-	-	-	-
Cusk	<i>Brosme brosme</i>	20.0	1.8	-	-	0.032	0.94	-
Drum: Red	<i>Sciaenops ocellata</i>	-	-	-	-	-	-	-
Flounder:								
Blackback	<i>Pseudopleuronectes americanus</i>	15.5-17.8	1.8-4.2	-	-	-	-	-
Starry	<i>Platichthys stellatus</i>	14.9-19.0	0.87-3.4	85	285	-	-	-
Yellowtail	<i>Limanda ferruginea</i>	-	-	56	366	-	-	-
Fluke	<i>Paralichthys dentatus</i>	20.6	0.07	-	-	-	-	-
Haddock	<i>Melanogrammus aeglefinus</i>	15.5-20.5	.05-1.3	61	304	0.05	0.08-1.1	2.4
Hake	<i>Urophycis tenuis</i>	15.5-16.3	0.2-0.6	-	-	-	-	-
Halibut:								
Pacific	<i>Hippoglossus stenolepis</i>	15.1-20.6	0.21-7.02	53	379	0.07	0.06	9.2
Arrowtooth	<i>Atheresthes stomias</i>	15.0-18.8	0.86-4.38	-	-	-	-	-
Herring:								
Alaska	<i>Clupea pallasii</i>	16.0	12.5	-	-	-	-	-
King whiting	<i>Menticirrhus species</i>	-	-	-	-	-	-	-
Lingcod	<i>Ophiodon elongatus</i>	15.32-18.1	0.35-0.70	62	352	-	-	-
Mackerel:								
Atlantic	<i>Scomber scombrus</i>	16.4-18.4	19.3-28.7	48	236	0.15	0.35	8.4
Pacific	<i>Scromberomorus maculatus</i>	21.6	1.01	89	292	-	-	-
(Spanish)	<i>Mugil cephalus</i>	-	-	81	292	-	-	-
Mullet								
Ocean perch:								
Atlantic	<i>Sebastes marinus</i>	16.0-19.9	0.2-4.1	79	269	-	-	-
Pacific	<i>Sebastes alutus</i>	-	-	79	324	-	-	-
Pilchard	<i>Sardinops caerulea</i>	17.9-27.3	2.0-25.1	-	-	-	5.4	-
Pollock:								
Atlantic	<i>Pollachius virens</i>	18.5-19.6	0.2	48	350	0.05	0.08	-
Alaska	<i>Theragra chalcogramma</i>	17.2-18.8	0.8-1.3	-	-	-	-	-
Red Snapper	<i>Lutjanus blackfordii</i>	-	-	70	323	-	-	-
Rockfish:								
Black	<i>Sebastes melanops</i>	17.0-17.9	.06-1.4	66	432	-	-	-
Orange	<i>Sebastes peniger</i>	16.4-18.0	0.2-0.5	71	347	-	-	-
Red	<i>Sebastes ruberrimus</i>	17.8-18.0	0.1-0.23	66	413	-	-	-
Sablefish	<i>Anoplopoma fimbria</i>	10.6-16.6	2.6-22.9	-	-	-	-	-
Salmon:								
Chum	<i>Oncorhynchus keta</i>	20.2-23.2	2.2-7.3	-	-	-	-	-
King	<i>Oncorhynchus tshawytscha</i>	20.1-21.2	5.1-7.2	-	-	0.10	0.23	7.2
Pink	<i>Oncorhynchus gorbuscha</i>	17.4-23.2	1.7-9.7	76	290	-	5.2	-
Red	<i>Oncorhynchus nerka</i>	20.3-21.9	7.8-13.7	-	-	-	-	-
Silver	<i>Oncorhynchus kisutch</i>	20.4-22.3	3.3-11.2	-	-	-	-	-
Scup	<i>Stenotomus versicolor</i>	-	-	63	287	-	-	-
Sea trout	<i>Cynoscion arenarius</i>	-	-	59	317	-	-	-
Shad	<i>Alosa sapidissima</i>	-	-	54	330	0.15	0.24	8.4
Smelt	<i>Thaleichthys pacificus</i>	13.2-15.3	4.6-8.8	-	-	-	-	-
Sole:								
Dover	<i>Microstomus pacificus</i>	12.8-17.6	0.5-2.0	-	-	-	-	-
English	<i>Parophrys vetulus</i>	16.0-16.8	0.58-1.8	91	330	-	-	-
Flathead	<i>Hippoglossoides ellasodon</i>	19.0-19.7	1.00-1.2	-	-	-	-	-
Lemon	<i>Pleuronectes quadrituberculatus</i>	16.1	1.0	-	-	-	-	-
Petrale	<i>Eopsetta jordani</i>	14.4-16.4	0.3-3.0	96	268	-	-	-
Rex	<i>Clyptocephalus zachirus</i>	17.0	0.7	-	-	-	-	-
Rock	<i>Lepidopsetta bilineata</i>	19.2	1.3	-	-	-	-	-
Yellowfin	<i>Limanda aspera</i>	17.0	1.3	-	-	-	-	-
Spot	<i>Leiostomus xanthurus</i>	-	-	-	-	-	-	-
Striped bass	<i>Roccus saxatilis</i>	-	-	-	-	-	-	-
Tilefish	<i>Lopholatilus chamaeleonticeps</i>	19.8	1.8	-	-	-	-	-
Tuna:								
Albacore	<i>Germo alalunga</i>	22.3-25.2	6.5-12.8	34	293	-	-	-
Yellowfin	<i>Neothunnus macroptera</i>	23.3-29.0	6.3-12.9	-	-	-	-	-
Whiting	<i>Merluccius bilinearis</i>	15.4	0.2	65	274	-	-	-

^{1/} DATA IN THIS TABLE ARE FROM THE BUREAU'S FISHERY TECHNOLOGICAL LABORATORIES. EDIBLE PORTION OF THE FISH WAS USED FOR ANALYSES. IN SOME INSTANCES, ONLY A LIMITED NUMBER OF SAMPLES HAVE BEEN ANALYZED. OTHER DATA ARE BASED ON REASONABLY COMPLETE SAMPLING FOR SEASON, LOCALITY OF CATCH, AND THE HARVEST OF SEVERAL DIFFERENT YEARS.

^{2/} MILLIGRAMS PER 100 GRAMS OF MEAT. TO CONVERT MG./100 G. TO MG./4 OZ. MULTIPLY THESE FIGURES BY 1.13.

If continuing research further establishes the essentiality of some of the unsaturated fatty acids peculiar to fish, the advantages of eating fish can then be more

Table 5 - Composition of Some Fresh-Water Fish of Great Lakes-Mississippi Valley Area^{1/}

Common Name	Scientific Name	Range of Protein	Range of Oil	Sodium	Potassium
		... (Percent) (Mg./100 g.) ...	
Carp	<i>Cyprinus carpio</i>	15.6-19.3	1-12	51	285
Blue pike	<i>Stizostedion vitreum</i> <i>glaucum</i>	18.3-19.4	0.7-1.19	-	-
Buffalofish	<i>Ictiobus species</i>	16.3-19.0	1.6-6.9	50	292
Lake chub	<i>Leucichthys species</i>	13.8-16.4	4-13	-	-
Lake herring (Huron)	<i>Leucichthys artedii</i>			38	280
Lake herring (Superior)	<i>Leucichthys artedii</i>			56	358
Lake smelt	<i>Osmerus mordax</i>	17.5-20.0	1.5-3.3	-	-
Lake whitefish	<i>Coregonus clupea-</i> <i>formis</i>	16.3-19.8	4.7-18.8	53	317
Lake trout	<i>Cristisomer namay-</i> <i>cush namaycush</i>	15.8-19.6	1.9-16.2	-	-
Mullet (suckers)	<i>Catostomidae species</i>			52	344
Sheepshead (Lake)	<i>Aplodinotus grunniens</i>	14.9-19.6	0.7-10.0	84	278
Sheepshead (River)	<i>Aplodinotus grunniens</i>			59	301
Yellow perch	<i>Perca flavescens</i>	18.2-20.3	0.8-1.2	67	238
Yellow pike	<i>Stizostedion vitreum</i> <i>vitreum</i>	18.7-19.7	0.8-3.0	52	324

^{1/} DATA IN THIS TABLE ARE FROM THE BUREAU'S FISHERY TECHNOLOGICAL LABORATORIES. EDIBLE PORTION OF THE FISH WAS USED FOR ANALYSES. IN SOME INSTANCES ONLY A LIMITED NUMBER OF SAMPLES HAVE BEEN ANALYZED. OTHER DATA ARE BASED ON REASONABLY COMPLETE SAMPLING FOR SEASON, LOCALITY OF CATCH, AND THE HARVEST OF SEVERAL DIFFERENT YEARS.

specifically stressed for nutrition in which such fatty acids are important. If fish oils are practically the only natural source of the more highly unsaturates (table 3), our studies on the characteristics of the fatty acids will have been well founded and profitable indeed.

Table 6 - Composition of Some Shellfish and Crustaceans^{1/}

Common Name	Scientific Name	Range of Protein	Range of Oil	Thiamine	Riboflavin	Niacin
		... (Percent) (Mg./100 g.) ...		
Lobster	<i>Homarus vulgaris</i>	19.7-20.7	0.3-2.5	-	-	-
Lobster	<i>Homarus americanus</i>	16.2	1.9	-	-	-
Scallop, Pacific	<i>Pecten maximus</i>	17.5	0.5-1.0	-	-	-
Shrimp	(unknown)	25.0	1.0	-	-	-
Crab: Dungeness	<i>Cancer magister</i>	22.6-24.2	1.4-1.5	-	-	-
King	<i>Paralithodes</i> <i>camtschatica</i>	18.3-19.6	1.3-1.5	0.18-0.3	0.13	5
Eastern, hardshell	Unknown--probably blue crab, <i>Callinectes sapidus</i>	15.8	1.5	0.14	0.06	2.7
Oyster: Eastern	<i>Ostrea virginicus</i>	4-9	0.7-2.8	0.18-0.3	0.23-0.46	1.2
Pacific (Jap.)	<i>Ostrea gigas</i>	10.7	0.8	-	-	-
Pacific (Native)	<i>Ostrea lurida</i>	-	-	-	-	-
Shrimp, Alaska	<i>Pandalus borealis</i>	21.1	0.8	-	-	-
Mussel	<i>Mya edulis</i>	8.7-13.0	1.1-1.3	-	-	-
Clam: Soft	<i>Mya arenaria</i>	11.4-13.6	1.0-1.7	-	-	-
Little neck	<i>Paphia staminea</i>	13.5	1.0	-	-	-
Cockle	<i>Cardium corbis</i>	10.1-13.5	0.9-1.4	-	-	-
Butter	<i>Saxidomus giganteus</i>	12.8-15.1	1.6-2.8	0.1	0.18	0.16
Abalone, Alaska	<i>Haliotea kamtschatica</i> <i>kama</i>	17.1	0.7	-	-	-

^{1/} DATA IN THIS TABLE ARE FROM THE BUREAU'S FISHERY TECHNOLOGICAL LABORATORIES. EDIBLE PORTION OF THE FISH WAS USED FOR ANALYSIS. IN SOME INSTANCES ONLY A LIMITED NUMBER OF SAMPLES HAVE BEEN ANALYZED. OTHER DATA ARE BASED ON REASONABLY COMPLETE SAMPLING FOR SEASON, LOCALITY OF CATCH, AND THE HARVEST OF SEVERAL DIFFERENT YEARS.

Table 7 - Composition of Some Protein Foods^{1/}

Food	State	Portion	Food Energy	Protein	Oil
		Ounces	Calories (Grams)	
Bacon, Canadian	Raw	4	262	25	17
Beef: Hamburger	Raw	3	316	19	26
Porterhouse	Boneless	3	293	20	23
Round	Boneless	3	197	23	11
Rib roast	Boneless	3	266	20	20
Roast	Canned	3	189	21	11
Bluefish	Baked	4	193	34	5
Bluefish	Fried	5.3	307	34	15
Cheese: Cheddar	-	1	113	7	9
Cottage	-	1	27	6	.1
Cream	-	1	106	2.6	10.5
Chicken: Broiler	Raw, boneless	8	332	44	16
Roaster	Raw, boneless	4	227	23	14
Fryer, breast	Raw, boneless	8	210	47	1
Fryer, leg	Raw, boneless	5	159	29	4
Clams	Raw, canned	4	92	14.5	1.6
	Canned	3	44	6.7	0.9
Cod	Raw	4	84	18.7	0.5
	Dried	1	104	23.2	0.8
Eggs	Raw or cooked	1 medium	77	6	5.5
Flounder	Raw	4	78	17	0.6
Haddock	Fried	4	166	22.5	6.3
Halibut	Broiled	4	207	29.8	9
Pork	Raw	3	100	14.4	4.1
Herring: Atlantic	Raw	4	217	20.8	14.2
Pacific	Raw	4	106	18.8	2.9
Lamb: Chop	Cooked, boneless	3	356	20	30
Leg	Roasted, boneless	3	230	20	16
Mackerel: Atlantic	Canned	3	155	16.4	9.4
Pacific	Canned	3	153	17.9	8.5
Milk, whole	Raw	3	231	11.9	13.3
Oysters, meats	Raw	3	71.7	6.6	1.7
Peanuts	Roasted	1 cup	805	38.7	63.6
Peas	Green	1 cup	111	7.8	0.6
Pork: Ham	Cooked, boneless	3	339	20	28
Loin	Raw, boneless	3	284	20	22
Salmon:	Broiled	1 steak	204	33.6	6.7
King	Canned	3	173	16.8	11.2
Chum	Canned	3	118	18.3	4.4
Silver	Canned	3	140	17.9	7.1
Pink	Canned	3	122	17.4	5.3
Red	Canned	3	147	17.2	8.2
Sardines, Atlantic	Canned in oil	3	288	17.9	23
Pilchards, Pacific	Canned, natural	3	171	15.1	11.5
	Canned tom. sauce	3	184	15.1	12.6
Sausage, bologna	-	4	252	16.8	18.0
Frankfurter	Cooked	4	283	16.0	23.0
Scallops	Raw	4	89	16.8	0.1
Shad	Raw	4	191	21.2	11.1
Shrimp	Canned, drained	3	108	22.8	1.2
Swordfish	Broiled	1 steak	223	34.2	8.5
Tuna	Canned, oil, drained	3	169	24.7	7.0
	Canned, not drained	3	247	20.2	17.8
Veal: Cutlet	Cooked, boneless	3	184	24	9
Roast	Cooked, boneless	3	193	24	10

^{1/} DATA OBTAINED FROM U.S.D.A. HANDBOOK NO. 8, COMPOSITION OF FOODS, PP. 92-147.

Since the study of the efficiency of these unsaturated fatty acids in lowering blood-serum cholesterol will move hand in hand with the study on the nutritional essentiality of them, our work will allow us to keep abreast of the best present thinking by medical science. We therefore also can build on what may be found by other research workers with other fats.

In summary, then, an appealing, high-quality, nutritionally adequate, well-balanced food, available in suitable form for any home or institutional use, gives a strong foundation on which to build a program for aiding buoyant national health and for combating the inroad of not just one but of numerous types of nutritional diseases. On such a program is a sound and prosperous fishing industry based.



CANNED TUNA

Canned tuna is a familiar item in almost every American home and on every groceryman's shelf. It is economical, excellent nutritionally, easy to prepare, and universal in taste appeal.



Several species of fish are marketed as tuna, all of which are equally desirable to the homemaker. On the Pacific coast, the catch includes albacore, bluefin, skipjack, and yellowfin. Bluefin and little tuna are taken on the Atlantic coast. Albacore has lighter meat than the other species and is the only tuna permitted to be labeled as "white meat." The other species are labeled as "light meat" tuna.



Canned tuna is available in three different styles of pack. The pack does not indicate a quality difference, but refers to the size of the pieces in the can.



"Fancy or Solid Pack" is marketed in $3\frac{1}{2}$ -, 7-, and 12-ounce cans. This style is mechanically cut to convenient pieces and packed in oil. This pack is especially adaptable to salads and other dishes where chunks of tuna are desirable. It is the moderately-priced pack.

"Chunk Style" is marketed in $3\frac{1}{4}$ -, 6-, $6\frac{1}{2}$ -, and 12-ounce cans. This style is mechanically cut to convenient pieces and packed in oil. This pack is especially adaptable to salads and other dishes where chunks of tuna are desirable. It is the moderately-priced pack.

"Flake and Grated Style" is marketed in 6- or 11-ounce cans. This style is mechanically cut to smaller pieces than the "chunk style" and is also packed in oil. It is excellent for canapes or sandwiches where the tuna is blended into a paste. It is generally lower-priced than the preceding packs.

A number of specialty packs are also available, such as "tonno," consisting of solid-meat tuna packed in olive oil and about double the amount of salt; a "dietetic," packed in distilled water for people who must avoid salt and fat in their diets; a baby food; a tuna paste; and others.

The inexpensiveness and versatility of canned tuna account for this fish being the most frequently served canned fish in the United States. One or two cans of tuna, used as an extender in casseroles or salads, or on sandwiches, will provide an adequate serving for six people.



RESEARCH

IN SERVICE LABORATORIES



TECHNICAL NOTE NO. 45 - PREPARATION OF DRIED FISH SOLUBLES FROM CONCENTRATED PRESS LIQUORS ON A LABORATORY SCALE

Recent imports and subsequent use of dried fish solubles in this country have renewed interest in the possible domestic manufacture of this product. Earlier attempts by the U. S. Bureau of Commercial Fisheries to produce dry solubles by drum drying were not successful because the final product was hygroscopic. Subsequently, it was thought that a suitable product might be obtained by the use of organic solvents. Accordingly, two preliminary laboratory-scale tests were carried out on concentrated ocean perch press liquor containing 50-percent solids.



FIG. 1 - PRODUCING DRY MENHADEN SOLUBLES ON PILOT PLANT DRUM DRIER.

The first method involved distillation with ethylene dichloride. Approximately two volumes of boiling ethylene dichloride were added to the press liquor and the two components were mixed together. This mixture was then added to approximately twice its volume of boiling solvent (ethylene dichloride) in a distilling flask. Distillation was carried out under reduced pressure, provided by an aspirator pump, until the distillate was clear. The solids were separated from the ethylene dichloride remaining in the flask by filtration on a Buchner funnel, washed with fresh solvent, and then placed under vacuum at 90° C. (194° F.) to remove final traces of solvent. The total solvent used in the entire procedure was about five times the volume of the concentrated liquor.

The second method of preparing the dried solubles was a cold extraction with mixed solvents. Approximately two volumes of methanol-acetone (1:1) were added to the press liquor in a Waring blender, and then mixed for two minutes. The solvent was removed by filtration on a Buchner funnel, and the filter cake was remixed for 30 seconds with approximately two volumes of methanol-acetone (0.5:1). The solids were filtered off and remixed a third time for ten seconds with approximately one volume of acetone. The mixture was filtered and the filter cake was washed with approximately one volume of methanol. Solvent traces were removed under vacuum at 90° C. (194° F.) The total solvent used in the entire procedure was about six times the volume of the press liquor.

A proximate analysis of a sample prepared by each method is shown in table 1.

The dry solids were readily ground in a mortar to powders which differ in physical properties in that the distillation-dried material is somewhat lighter in color

Table 1 - Proximate Composition of Dried Ocean Perch Solubles Prepared by Ethylene Dichloride Distillation and by Methanol-Acetone Extraction

Method of Sample Preparation	Proximate Composition of Sample			
	Protein	Fat	Ash	Moisture
	(Percent)			
Ethylene Dichloride Distillation	77.2	1.0	20.2	3.2
Methanol-Acetone Extraction	78.0	2.3	13.6	6.4

and stronger in odor than the extracted material. When exposed to the air the powders do not readily absorb moisture and remain free flowing.

These procedures are tentative and additional trials by industry, either in the laboratory or on a pilot-plant scale,

would probably indicate that smaller volumes of solvent can be used, particularly in the extraction method where it may also be found that different ratios of methanol to acetone are more efficient, or even that a single solvent can be used. These considerations would have an important bearing upon the economics of the process.

Because of the preliminary nature of this work no effort was made to determine the effect of solvent treatments on the nutritive values of the dried solubles.

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ONE SKIPJACK TUNA TAGGED TWICE AND CAUGHT THREE TIMES

A skipjack tuna (aku) with an insatiable taste for feather lures has set some sort of record in local piscatorial circles by getting himself on the hook three times within 16 days, the last time for good. According to the Director of the Pacific Oceanic Fishery Investigations of the U.S. Bureau of Commercial Fisheries, the small 6-pound tuna was first caught on November 20 by a fisherman on the Bureau's research vessel John R. Manning off the island of Lanai. A plastic dart tag was jabbed into the back of the tuna just below his second dorsal fin and he was tossed back into the ocean "in the hope that subsequent recaptures (for which the chances are currently running about 8 in 100) may shed light on the little understood movements of this commercially-valuable species in Hawaiian waters."

Only three days later, in the same area off Lanai, the same tuna was again caught by the John R. Manning. The sea-going scientists, busy tagging tuna, were a bit surprised to find one of their subjects already outfitted with one plastic streamer, but they quickly attached a second tag and again tossed the fish back into the sea.

When the commercial sampan Dolphin fished off Lanai on December 6, and chicken feather jigs were once again on the menu, the twice-tagged tuna was again caught for the last time.



TRENDS AND DEVELOPMENTS

American Samoa

NATIVE FISHERMEN LEARNING LONG-LINE TUNA FISHING TECHNIQUE: The native American Samoans are learning the long-line method of tuna fishing, which the Japanese have successfully developed. A former naval 50-foot tender has been made available for the project, and the Samoan fishermen have demonstrated their ability to catch big fish on a limited commercial scale. The only limit now seems to be imposed by their boats and fishing gear, and it has been rumored that the idle *M/V Samoa* may be leased by the Government of American Samoa for use as a fishing vessel.

The Samoan crew fishes off Tutuila, in sight of land, and disposes of its catch by selling tuna to the local cannery, and other types of fish are sold in Pago Pago direct to the local population for 10 cents a pound.

The Governor of American Samoa takes a close personal interest in the possibility of developing commercial fishing as a major Samoan industry. He has arranged permission to appoint each year a candidate from American Samoa to the U. S. Maritime Academy in New York on a full scholarship basis with all traveling and tuition expenses paid. This program should provide qualified Samoan masters of future fishing vessels.

Looking beyond the Samoan group, the Governor sees the possibility of Fijians, Tongans, and other South Pacific Islanders joining in a large scale commercial-fishing operation, reaping direct benefit from the valuable fish which abound in their waters.

A substantial amount of fish is being caught by Japanese fishermen in South Pacific waters for sale to the American Samoa cannery operated on a lease basis by a large United States west coast cannery. The Governor feels that the Samoan people should have an opportunity to share in this growing industry.

The fishing industry has been a great boon to American Samoa. The Pago Pago cannery employs between 350 and 400 local people in the processing and packing of the tuna which 30 to 40 Japanese fishing vessels deliver to the cannery regularly.

The cannery's payroll is estimated to contribute a quarter of a million dollars annually to American Samoa's national income. More than any other factor, the cannery operation gives back to American Samoa the prosperity it lost when the U.S. Navy closed down its base in Pago Pago in 1950 (*Samoa Bulletin*, March 28, 1958).

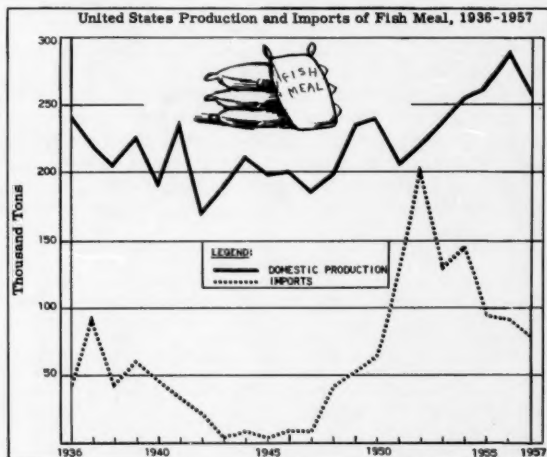


Byproducts Production for U. S. & Alaska in 1957

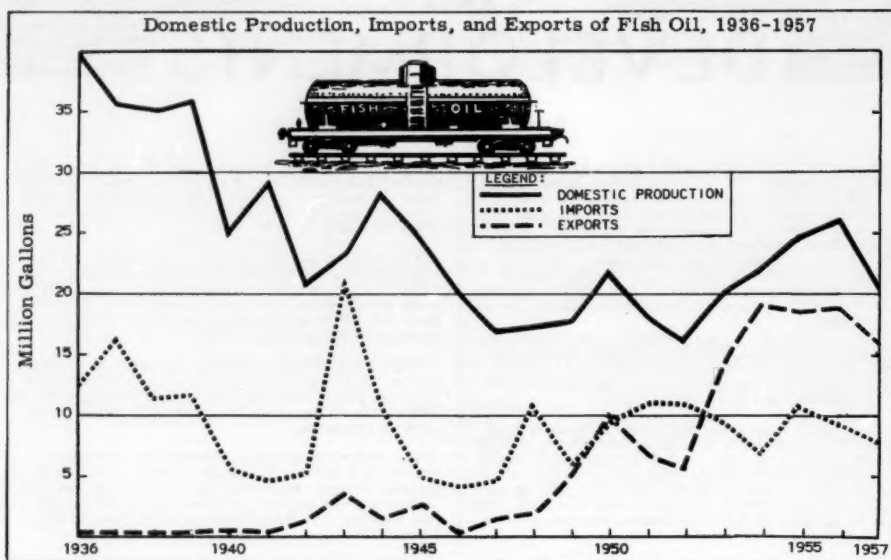
The United States and Alaska production of fish meal and scrap amounted to over 262,000 tons during 1957--a decline of 33,000 tons or 11 percent as compared with 1956. The production during June-August made up nearly 50 percent of the year's total.

Imports of fish meal during 1957 amounted to 81.2 thousand tons as compared with 91.4 thousand tons imported during 1956.

Production of fish oil during 1957 totaled 20.1 million gallons, compared with 26.8 million gallons during 1956. A drop in the production of oil from menhaden--down 6.6 million gallons--was largely responsible for the overall reduction in oil.



The yield of fish solubles during 1957 amounted to 187.8 million pounds. This represented a decline of 10.3 million pounds as compared with 1956. During 1957, the production of homogenized-condensed fish amounted to 56.8 million pounds--a drop of 2.8 million pounds as compared with the previous year.



California

AERIAL TECHNIQUES BEING DEVELOPED TO CENSUS COMMERCIAL AND SPORT FISHING (Airplane Spotting Flight 58-1): To establish procedures for applying aerial techniques to census both commercial and sport fishing operations was the purpose of this airplane flight by the California Department of Fish and Game's Cessna 3632C. Since the results were encouraging, future aerial scouting routines will be devised. Considerable information was obtained on the possibilities of counting units of crab gear in the water and in making instantaneous counts of sport fishermen, both clam diggers and hook-and-line fishermen.

The inshore area between Yankee Point, Monterey County, and Bodega Bay, including San Francisco, Drakes, and Tomales Bays was surveyed by air to: (1) Establish procedures for applying aerial techniques to censusing the crab fleet, crab gear in operation, and sport clamming activity. (2) Tally the number of hook-and-line fishermen utilizing the beaches, piers, jetties, and rocky areas. (Dingell-Johnson Federal Aid Project F-12-R). (3) Scout for pelagic fish schools.

Weather conditions were excellent on March 2, with very clear skies and calm water prevailing over the entire area. On the 3rd rain showers prevented scouting until 10 a.m. but thereafter weather conditions were comparable to those on the previous day.

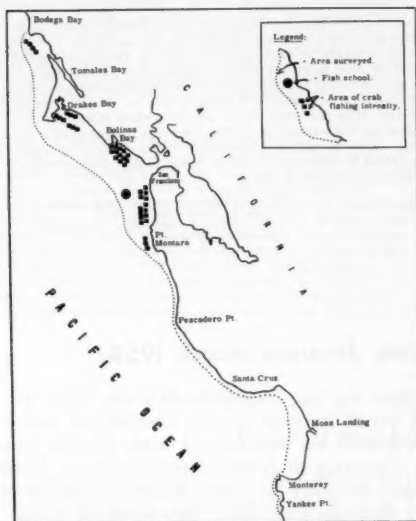
Crab Fishing Census: The crabbing area from Half Moon Bay to Bodega Bay was flown to determine the techniques of aerial censusing applicable to counting crab gear and crab boats as well as delineating the area of crab fishing activity.

The buoys of crab traps were visible at altitudes up to 2,000 feet. However, accuracy in survey observing would be best at 800 to 1,000 feet. Pictures were taken over the buoys at several altitudes from 800 to 2,000 feet. Infrared and Kodachrome film was used to determine which film would most clearly show the buoys on the surface of the ocean.

Twenty-one strings of traps consisting of 24 to 45 units were observed. These traps were set over sandy bottoms from Half Moon Bay to Bodega Bay

at distances of one-half to four miles from shore. The greatest concentrations of gear were off Stinson Beach, Marin County, and the Lake Merced-Westlake section of San Francisco.

On March 3 the same area of ocean was covered by air observation of crab boats. The boats were identifiable as crab boats either while tending gear or running to port. Twenty crab boats were observed. However, since all boats do not operate on the same time schedule, the total boats fishing on a given day would not be obtained by one flight on any day.



AIRPLANE FLIGHT 56-1, MARCH 2-3, 1958.

An estimate of the area covered by the crab fleet and the effort expended can be made by censusing the gear as set. A special flight pattern

and counting procedure can be used to reveal the approximate number of traps fishing at any one time. Such a census taken at 3- to 4-week intervals would reveal the fishing effort expended over a given area.

Clam Digging Census: During the period of the March 2 afternoon minus tide, a count of sport fishermen engaged in clam digging was made from Bodega Bay south to the mouth of the Salinas River. The total count was 909 persons. The clammers counted digging various species in bays and lagoons numbered 330. Those on the ocean beach after Pismo clams totaled 579.

This aerial census of clam-digging activity is the first that has been made for this area of the California coast. The count represents the number of persons observed to be harvesting clams at the time the flight was made. This does not allow for turnover of fishermen during the several hours of clamming during the low tide period. Therefore, it is recognized that the count of clam diggers during the flight is considerably less than the total number of persons harvesting clams during low tide period.

The use of aerial techniques in censusing clam-digging activity is considered to be of great value in assessing the public use of the clam resources.

Hook-and-Line Sport Fishing: A total count of all hook-and-line sport fishermen on the beaches, rocky shore, jetties, and on some of the piers was made in conjunction with turnover counts being conducted by personnel on the ground at certain key areas along the shore.

Because of the large numbers of anglers on the piers on March 2 and also due to the fact that turnover counts were being conducted at several of the piers, all the piers were not counted on each day.

Pelagic Fish Census: Despite calm seas and excellent visibility only one pelagic fish school was observed over this entire area. This small school was sighted off San Francisco about two miles from shore. Species identification was not possible.

* * * * *

AERIAL FISH SPOTTING UTILIZED BY SOME CALIFORNIA VESSELS: Some California vessels regularly and others erratically utilize planes to aid them in spotting fish. All of the plane spotters operate as independent contractors and they are hired by the vessels. There is no cannery, market, or any other commercial processing plant that hires plane spotters. This is probably due to the fact that in California there are only a few vessels that are owned and totally-controlled by cannery. Practically all of the vessels operate individually and have contracts with cannery for their fish catches.

Most of the spotters, at the present time, sell their services to the individual fishing vessel owners and their crews. The agreement for payment between the vessel owners and crews and the plane spotters provides for two different arrangements, depending upon which the parties prefer. One arrangement is that the plane spotter receives 7½ percent of the gross proceeds of the catches the vessel makes as a direct result of the spotter setting them on the fish. The other arrangement is that the vessel pays the fish spotters 5 percent of the gross proceeds of all the fish the

vessel catches, whether or not the plane spotter is responsible for the catch.

The number of spotters varies greatly. It depends upon the season, availability of fish, and skill. At the present time, however, there are 8 pilots or spotters operating out of San Pedro. Although during the height of the sardine season there will be as many as 15, only a very small percentage of these pilots spot for fish on a full-time basis. Most of them have other jobs and drop in and out of plane spotting, depending upon whether they can make any money or not.

The equipment most of them use consists of a small light plane, such as a Piper or a Cessna, which is equipped with a two-way radio. None of the planes presently operating are float planes. Although float planes have been used in the past, they are considered impractical due to the extra maintenance costs. Two amphibious planes were also used in the past, one a "Widgeon" and the other a "See-Bee." Both these planes proved to be expensive to operate and maintain and dropped out.

The spotter pilots fly their planes all hours of the day and night. It is not uncommon for them to be aloft for periods up to 7 hours at a stretch and during the season the fliers will spend as many as 16 hours a day aloft. The operations range from Point Conception, with occasional trips farther North, and south to San Diego. They search all the channel islands which lie from 15 to 60 miles offshore and also explore banks as far as 90 miles offshore. Flying these distances offshore in light airplanes and at night is extremely hazardous, yet only two men have been lost in Southern California since 1946, when plane spotting for fish started.

Several methods of operation have been tried in the past, but the most successful seems to be a plane which has 5 or 6 "steady" vessels. The spotter reports exclusively to these vessels, usually in code. Handling more than this number of vessels causes arguments and difficulty, as fishermen continually harass the pilot claiming he favors one vessel against the others, etc.

While plane spotting for fish appears to be successful in that numerous catches are made by fishermen when they cannot see the fish because the spotter directs the setting of the net from the air, there is still pessimism on the part of some as to whether or not more fish is actually caught on an annual basis by those vessels assisted by plane spotters. There is no doubt that if an individual vessel would operate exclusively with one plane he would do better, but the way the planes are spread out among the vessels it is difficult to accurately gage the net results.

Plane spotters were also used in the clipper bait-boat fleet fishing for tuna. Although they operated for several years and some results were reported, all of them have been abandoned. The chief use of planes by the clipper fleet was in the location of bait. When the clipper had to sail inshore to find bait, it could be directed to a location where bait was available. This saved much running around. The spotting of tuna also proved helpful, but schools of tuna move so rapidly that information as much as an hour away is generally worthless, for by the time the vessel reached the fish they had moved. Other reasons for the abandonment was the high cost of maintenance, the difficulty of hoisting the planes aboard on the high seas, difficulty encountered in making landings on the high seas, and the reluctance of pilots to take these jobs, because conditions were hazardous.

There is no question that fish can be readily spotted and identified from the plane, much wider areas can be covered than by a single vessel, and fish can be caught when they cannot be seen from the vessel itself. The chief problem of plane spotting in California is in the organization of the effort being made and is basically due to the returns to the pilot. It is not feasible for an individual vessel to hire a plane as the expenses would outweigh the vessel's proceeds. Thus it becomes necessary for a pilot to operate with a fleet of vessels, and in so doing he cannot serve the individual vessels as well.

--BY A. D. SOKOLICH, MARKET NEWS REPORTER,
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Cans--Shipments for Fishery Products, January-March 1958



Total shipments of metal cans during January-March 1958 amounted to 22,772 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 20,882 tons in the same month a year ago. Canning of fishery products in January-March this year was confined largely to tuna, Pacific mackerel, anchovies, shrimp, Gulf oyster, and clams. The increase in shipments in the first quarter of 1958 as compared to the same quarter of 1957 is due to the expectations of more activity in tuna and salmon canning this year.

NOTE: STATISTICS COVER ALL COMMERCIAL AND CAPTIVE PLANTS KNOWN TO BE PRODUCING METAL CANS. REPORTED IN BASE BOXES OF STEEL CONSUMED IN THE MANUFACTURE OF CANS, THE DATA FOR FISHERY PRODUCTS ARE CONVERTED TO TONS OF STEEL BY USING THE FACTOR: 23.0 BASE BOXES OF STEEL EQUAL ONE SHORT TON OF STEEL.



Coast & Geodetic Survey

CHARTING OF COASTAL WATERS BEGINS: The Coast and Geodetic Survey, U. S. Department of Commerce, announced on April 1, 1958, that the major units of the Survey's fleet were due to sail for summer surveying assignments along the country's coasts.

Since the Survey was founded in 1807 steady progress has been maintained in surveying and charting more than 90,000 miles of coastline. Some of the areas scheduled for this summer, especially in Alaska, have never been charted in detail. Even along our much-traveled Atlantic coast, threats to navigation are present in the form of recent wrecks, shoreline changes, and dangerous shoals.

Survey officials stated that these changes, as well as new lights, buoys, and other aids to navigation must be noted on the Survey's charts as they are published.

Due to the urgent demand for surveys in some areas, four of the Survey's ships were already at work prior

to April 1. Those in southern waters continued operations throughout the winter.

Sailing dates and ports of departure for 10 of the Survey ships were as follows:

St. Petersburg, Fla.: April 3, the **Hydrographer**, sailed to Georges Bank in the Gulf of Maine to complete a survey that was started in April 1957. It is the first to be made of this important fishing ground in the vicinity of Georges Bank and Nantucket Shoals in 26 years.

Norfolk, Va.: April 2, the Survey ship **Cowie**, resumed surveys in the lower Chesapeake Bay in the vicinity of Onancock Creek and southward. It is expected that this project will be completed before the close of the season and the ship will be moved to the entrance to the Potomac River.

April 7, the **Hilgard** and **Wainwright**, also at Norfolk, were assigned to complete "wire-drag" operations that

were started last season in the vicinity of Isle au Haut, Maine. The ships will also undertake a hydrographic survey off Schoodic Peninsula, Maine, near the Acadia National Park. A wire-drag is a metal cable that, when pulled through the water at a predetermined depth by two vessels, detects uncharted rocks or wrecks that may be hazards.

Seattle Wash: April 2, the *Bowie*, has been assigned to the Columbia River area. The *Bowie* is supported by the West Coast Field Party utilizing hydrographic launches.

April 7, three of the surveying ships sailed from this port for southeast Alaska. They are the *Hodgson*, the *Patton*, and the *Lester Jones*.

April 9, the *Pathfinder*, one of the Survey's largest ships, was making a wire-drag survey of Guemes Channel in Puget Sound. The survey is being made at the request of the Texas Company to assure that there are no obstructions for the deep draft tankers which will bring in Middle East oil to the Company's new refinery on Fidalgo Island. The channel will be swept to a depth of 50 feet.

April 16, the *Pathfinder* sailed for Kasaan Bay in southeast Alaska where it will complete a survey project before departing for Dutch Harbor, Aleutian Islands. En route to Dutch Harbor the *Pathfinder* conducted oceanographic investigations in the vicinity of Pamplona sea ridge, lat. 50°32' N., long. 142°35' W. Bottom samples were obtained by dredging and deep-sea soundings were made. She will then survey the north coast of the Alaskan Peninsula. Her sister ship, the *Explorer*, sailed directly to the Aleutians, across the Gulf of Alaska. It was from crossings such as this that information was pieced together which led to the discovery of

an extensive crack on the Gulf's floor last September. The *Explorer* will concentrate on Atka Pass and the south coast of Atka Island.

An electronic distance-measuring device, the Tellurimeter, which was field tested in the Aleutians last season and later used on the Interstate Highway surveys in this country, will be used to establish the control points for *Explorer's* survey along the north and south sides of Amliia Island.

Four ships at work prior to April 1 are: The *Marmer*, which is now making a circular survey of New York Harbor. The *Gilbert*, making a current survey of Georgetown Harbor, S. C. The *Sosbee*, is continuing a survey of Tampa Bay, Fla., which should be completed within a year. One unit of the East Coast Field Party, which has been supporting the *Sosbee* in Tampa Bay, left St. Petersburg about April 1, to survey a portion of the St. Johns River adjacent to the Naval Air Station at Jacksonville, Fla. The last survey to be made in the area was in 1934-35. The *Scott* is now making an inspection of the east coast from Norfolk, Va., to Key West. The information will be used in revisions of the Coast Pilots which are books that contain detailed information to supplement the charts.

The Coast and Geodetic Survey's responsibility for charting the coastal waters of the United States and its possessions involves over 90,000 miles of tidal shoreline and about 25 million square miles of water area. In order to accomplish this task the Survey has resorted to modern electronic instruments such as Raydist, Shoran, and the Electronic Position Indicator which are used to determine the ships position. The water's depth is determined by the sonic depth recorder, another electronic device that accurately measures the time it takes a sound wave to travel to the bottom and return as an echo.

Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-APRIL 1958: Fresh and Frozen Fishery Products: A total of 2.2 million pounds (value \$1.2 million) of fresh

and frozen fishery products were purchased in April 1958 for the use of the Armed Forces under the Department of Defense by the Military Subsistence Market Centers. The April 1958 purchases were higher than the purchases in the preceding month by 31.4 percent and above the same month in 1957 by 21.5 percent. The value of the purchases this April exceeded the March 1958 purchases by 18.1 percent and the April 1957 purchases by 22.7 percent.

Table 1 - Fresh and Frozen Fishery Products, Purchased by Military Subsistence Market Centers, April 1958 with Comparisons

QUANTITY				VALUE			
April		Jan.-April		April		Jan.-April	
1958	1957	1958	1957	1958	1957	1958	1957
... (1,000 Lbs.) (\$1,000) ...			
2,232	1,837	7,256	7,376	1,190	970	4,142	3,832

Table 2 - Canned Fishery Products Purchased by Military Subsistence Market Centers, April 1958 with Comparisons

Products	QUANTITY				VALUE	
	April		Jan.-April		April	Jan.-April
	1958	1957	1958	1957	1958	1957
... (1,000 Lbs.) (\$1,000) ...		
Tuna . . .	543	-	955	841	264	482
Salmon .	86	-	1,327	992	51	724
Sardine .	9	12	33	31	4	12

For the first four months of 1958 purchases totaled 7.3 million pounds, valued at \$4.1 million--a decrease of 1.6 percent in quantity, but 8.1 percent higher in value as compared with January-April 1957.

Canned Fishery Products: Tuna was the principal canned fishery product purchased by the Military Subsistence Mar-

ket Centers in April 1958. During the first four months of 1958 the total purchases of canned fish were up 24.2 percent from the same period of 1957.

NOTE: SOME LOCAL PURCHASES ARE NOT INCLUDED. ACTUAL PURCHASES ARE HIGHER THAN INDICATED BECAUSE IT IS NOT POSSIBLE TO OBTAIN LOCAL PURCHASES.



Fisheries Loan Fund

LOANS THROUGH MAY 14, 1958: As of May 14, 1958, a total of 436 applications for fisheries loans totaling \$15,905,558 had been received. Of these 220 (\$5,701,592) have been approved, and 124 (\$3,485,246) have been declined. As several applications have been deferred indefinitely at the request of the applicants, sufficient funds have been available to process all applications received to date. Unless the amount of funds applied for increases unexpectedly, funds will be available to process applications received during the next two months without delay.

The following loans have been approved between July 1, 1957, and May 14, 1958:

New England Area: Kenneth L. Lovett, Rye, N. H., \$4,500; Franklin L. Libby, Beals, Me., \$3,000; Charles A. Bennett, Provincetown, Mass., \$6,000; Samuel Cottle, Jr., Wakefield, R. I., \$27,825; Bluewaters, Inc., Gloucester, Mass., \$53,000; Pasquale Maniscalco, Somerville, Mass., \$43,195; Harmon Tibbetts, Jr., Boothbay Harbor, Me., \$2,000; Silver Sea Inc., Portland, Me., \$42,282; O'Hara Bros. Co., Inc., Boston, Mass., \$102,800; Vandal, Inc., Portland, Me., \$25,000; Gerald L. Small, Owls Head, Me., \$1,000; Cumberland Fisheries, Portland Me., \$46,000; Salvatore Passanisi, Somerville, Mass., \$53,300; Lorenzo Sossanno, Gloucester, Mass., \$40,000; Muskegon, Inc., Portland, Me., \$32,000; Boat M. C. Ballard, Inc., Boston, Mass., \$39,910; Trawler Bonnie Billow, Inc., Boston, Mass., \$35,062; Warren S. Martin, Portland, Me., \$6,000; Cleary Corp., New Bedford, Mass., \$51,500; Luben-ray Inc., Fairhaven, Mass., \$39,500; Boat Camden Inc., New Bedford, Mass., \$34,600; Robert McLellan, Boothbay Harbor, Me., \$23,500; John Bruno & Son Co., Inc., Boston, Mass., \$27,121; Boat Mary Anne, Inc., New Bedford, Mass., \$40,000; Charles C. Miller, Point Pleasant N. J., \$20,469; James Maniscalco, Somerville, Mass., \$36,000; Albert M. Bridges, Brooklin, Me., \$4,000; John Field, Monhegan Island, Me., \$3,000; Attilio Marchetti, Newport, R. I., \$8,500; Henry S. Powell, Waldoboro, Me., \$7,000; Segura & Segura, Provincetown, Mass., \$7,684; John Wright Morton II, Scarborough, Me., \$12,000; Marco A. Giacalone, Boston, Mass., \$36,000; and Cosimo Parco, Gloucester, Mass., \$35,000; total, \$948,748.

Middle Atlantic Area: Charles H. Smyth, Jr., Absecon, N. J., \$4,000.

South Atlantic and Gulf Area: E. H. Holton T/A, Vandemere, N. C., \$125,000; Valcour Vizier, Cut Off, La., \$19,306; W. C. Mobley, Aransas, Tex., \$24,000; Fred F. Sanders Seafood, Inc., Savannah, Ga., \$49,324; J. H. Morgan, McIntosh, Ga., \$20,000; Louie Rash-Cecil Drake, Pascagoula, Miss., \$32,000; Wm. Milton Anders, Kemah, Tex., \$15,500; Paul V. Pitre & Louis J. Pitre, Cut Off, La., \$28,000; Billy Jay Brown, New Orleans, La., \$10,991; Monroe & Guy Taylor, Sea Level, N. C., \$18,569; Richard H. Jones, Fernandina Beach, Fla., \$16,000; Hilton Toomer, Key West, Fla., \$14,000; Richard W. Marshall, Gulfport, Miss., \$5,800, and Robert D. Smallwood, Jr., Everglades, Fla., \$24,500; total, \$402,990.

California: Darrell D. Foreman, Costa Mesa, \$10,000; Charles E. Graham, San Diego, \$5,000; Malcolm S. Rice, San Diego, \$87,780; R. Carpenter & Sons, Bodega Bay, \$10,000; Anthony F. Bozanich, San Pedro, \$30,000; Grover V. Nell, San Diego, \$8,900; Nick Trutanich, San Pedro, \$68,000; Josie Scuito, San Diego, \$75,000; N. F. Trutanich, San Pedro, \$130,000; Charles L. & Catherine N. White, San Diego, \$1,383; Floyd A. Hill, San Diego, \$4,975; and Michael F. Schroeder, Aptos, \$4,363; total, \$435,401.

Hawaii: John A. Hodges, Lanikai, Oahu, \$9,000; Harold Fujiwara, Waialua, Oahu, \$7,290; and Mitsuo Higashi, Waimea, Kauai, \$3,250; total, 19,450.

Pacific Northwest Area: Grant U. Baldwin, Westport, Wash., \$2,500; K. R. Thomas, Chehalis, Wash., \$7,000; A. T. Davies - Tuna Vessel Commander Inc., Tacoma, Wash., \$47,187; A. T. Davies, Seafarer, Inc., Tacoma, Wash., \$66,872; Kaare Angell, Snohomish, Wash., \$10,000; Richard Branshaw, Tokeland, Wash., \$5,000; Martin L. Smith, Rockaway, Ore., \$6,000; Clarence R. Bushnell, Tokeland, Wash., \$9,634; John W. Nevill, Seattle, Wash., \$3,200; Albert A. Anderson, Seattle, Wash., \$2,500; Robert Egelkrout, Burlington, Wash., \$15,000; John W. Nevill, Seattle, Wash., \$1,575; Frank E. Deiner, Edwards, Wash., \$2,500; Lawrence T. Fleming, Chehalis, Wash., \$3,500; Cal Scott Cutler, Westport, Wash., \$1,650; Boat Daily, Seattle, Wash., \$10,000; James H. Cope, Seattle, Wash., \$15,000; Erling Jacobsen, Seattle, Wash., \$22,000; Joseph & Peter Evich, Bellingham, Wash., \$25,000; and Samuel E. Hendricksen, Seattle, Wash., \$10,000; total, \$266,118.

Alaska: Gerald G. Bennett, Ketchikan, \$1,200; Charles E. Swan, Douglas, \$750; Allen Sandstrom, Cordova, \$2,500; and Orville F. Wagner, Idaho Inlet, \$8,000; total, \$12,450.

Great Lakes Area: William Brown, Croswell, Mich., \$8,000.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, AUGUST 1957, P. 18.



Fishery Marketing Specialist GS-5 Examination


The U. S. Civil Service Commission announced on February 18, 1958, Announcement No. 156 (B), an assembled examination for positions of Fishery Marketing Specialists, GS-5 (\$3670 a year). A list of places where examination will be held accompanies this announcement. The examination remains open until further notice.

The positions to be filled from this examination are located in the U. S. Fish and Wildlife Service of the Department of the Interior, and other Federal agencies in Washington, D. C. and throughout the United States, its Territories and possessions.

Fishery Marketing Specialists' work relates to fishery production and marketing. The duties involve investigation and market research concerning commercial fisheries or fishery commodities; also perform work relating to Fishery Market News reporting services--collection, analysis, and dissemination of information relating to production, supply, demand, movement, distribution, prices, and other phases of marketing. In some of these positions a small amount of typing is expected.

Except for the substitution of education for experience, applicants must have had 3 years of responsible experience in any position involving (a) the collection and compilation of market information and statistics on fishery products and the preparation from such data of analytical articles or bulletins for publication; or (b) marketing research requiring knowledge of commercial methods and practices in producing, processing,

Announcement No. 156 (B)
Issued: May 6, 1958
No Closing Date



The United States Civil Service
Commission
Announces an Examination for

**Fishery
Marketing
Specialist**

\$3,670 a Year
(Grade GS-5)

APPLY TO
Executive Secretary
Board of U. S. Civil Service Examiners
Fish and Wildlife Service
Department of the Interior
Washington 25, D. C.

transporting, or marketing of fishery products; or (c) accounting, market promotional, or production activities in the fisheries requiring a good knowledge of methods and practices in that field. The experience must have been of a progressively responsible nature.

Study successfully completed at an accredited college or university may be substituted for experience as follows: (1) Four years of study which included courses as shown in (a) or (b) below may be substituted for a maximum of 3 years of experience: (a) At least 10 semester hours or 15 quarter hours in fisheries subjects. Majors may include fish and game management, fish and wildlife conservation, biology, and zoology. (b) At least 10 semester hours or 15 quarter hours in economics of food or marketing of food or in statistics. Majors may be economics, business administration, marketing or statistics. Less than 4 years of education may be substituted for experience at the rate of 1 year of education for 9 months of experience provided that such education included a proportionate number of semester hours in the qualifying subjects above. (2) Study with a major in economics or marketing in fields other than food may be substituted for experience at the rate of 1 academic year of education for 6 months of experience, not to exceed 2 years of the required experience.

Competitors for all positions will be required to take a written test designed to measure their ability to understand, learn, and interpret regulations and practices and in general, to perform the duties of the position. The test will include interpretations of written paragraphs, the meanings of words, arithmetic computations and problems, and some questions involving spatial ability. Samples of the tests on Form AN 3514 (see questions 1 through 8) will be furnished to applicants with their notices of admission to the written test. About 2 hours will be required for the written test.

Competitors will be rated on the written test on a basis of 100. To pass the written test, competitors must attain a rating of at least 70.

You must also show that you are a United States citizen; that you are physically able to do the work involved in the position for which you apply; and that you have reached your 18th birthday on the date of filing application. There is no maximum age limit for this examination.

For further information on how to apply for this examination write to any Civil Service Regional Office, or U. S. Civil Service Commission, Washington 25, D. C.
NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, JUNE 1958, P. 27.



Florida

SHRIMP TAGGING PROGRAM: The multimillion dollar fishery for pink shrimp out of Key West, on the Tortugas grounds, depends on the shallow-water brackish areas at the southern tip of Florida for its supply of shrimp. The Everglades National Park area is part of the "nursery" grounds where tiny shrimp grow, protected from the dangers of oceanic life. When the shrimp get to be about 3-4 inches long they move seaward in enormous numbers. Later, when they become larger, they are caught by night-fishing trawlers out of Key West, Fort Myers, and other south Florida ports. The adult shrimp, as much as 7-8 inches long, spawn offshore and their microscopic larvae drift shoreward into Park waters.

Biologists of the Marine Laboratory of the University of Miami suspected that the large numbers of small shrimp seen in the Park waters were probably the young of the big shrimp caught offshore, but until recently this was not certain.

Then tag number 064, consisting of two kelly-green discs fastened to the shrimp by a nickel pin, came into the hands of a Marine Laboratory biologist. The tagged shrimp, which had been free 123 days, was caught on the fishing grounds 62 miles in a straight line from where it had been tagged in Coot Bay, a few miles north of Flamingo.

The shrimp, one of about 1,000 tagged in the Park area, had grown about 1-5 inches during the four months at large. This is an increase from about 100 "count" to 36 "count" in fishermen's language, meaning that it would have taken about 100 tails of shrimp the size it was when tagged to make a pound and only about 36 at the time of its capture to make a pound.

In addition to this tagging program, which is part of the research being conducted by the Marine Laboratory on the shrimp fishery for the Florida State Board of Conservation, shrimp have been tagged in the commercial fishery and returns have been surprisingly good. Between 25 and 30 percent of all tagged shrimp released have been captured a second time. The valuable information obtained on migrations and growth of the shrimp will eventually help conserve this great resource.



Fur-Seal Prices Advance at Government Spring Auction

An average advance of 8.9 percent in prices paid at the semiannual auction of Government-owned fur-seal skins marked the spring sale held in St. Louis on June 7. A total of 25,386 skins, products of the sealing industry administered by the Department of the Interior's Bureau of Commercial Fisheries on the Pribilof Islands of Alaska, brought \$1,809,272. This compares with 28,782 skins sold for \$1,983,208 at the October 1957 sale. The average for all skins sold for the account of the United States Government at the June 7 sale was \$71.27; the average at the October 1957 auction was \$68.90.

The Alaska skins included 7,568 black, 14,221 dyed "Matara" (brown), and 3,597 of the newest shade called "Kitovi." The black skins sold at an average of \$81.04; Mataras at \$67.84; and Kitovis at \$64.26.

In addition to the United States skins, 11,324 South Africa fur-seal skins were sold for private shippers and the account of the Government of South Africa at an average of \$26.60, an advance of 3.4 percent; 500 Uruguay fur-seal skins were sold for the Government of Uruguay at an average of \$26.36.

The auction held at the show rooms of the Fouke Fur Company in St. Louis, Mo., normally set for April, was delayed because of a labor-management dispute at the Fouke plant.

NOTE: SEE COMMERCIAL FISHERIES REVIEW, DECEMBER 1957, P. 21.



Great Lakes Fishery Investigations

FIELD TEST OF CHEMICAL FOR KILLING YOUNG SEA LAMPREY SUCCESSFUL: A successful field test of a chemical found effective in destroying young sea lamprey without harming fish was carried out on May 14, 1958, at Mosquito Creek, a well known rainbow trout stream flowing into Lake Superior about 15 miles east of Munising, Mich. The action of this particular chemical, one of several being investigated, had not previously been studied under stream conditions.

The chemical was fed into the stream above the areas infested with the parasite for eight hours. Young lamprey held in cages in the stream showed the effects of treatment within an hour and were all dead after seven hours of exposure. Lamprey in the stream were similarly affected and sampling crews found many dead, but no living lamprey, following the treatment.

Rainbow trout in the stream became restless, but only one casualty was observed and this a fish weakened by earlier sea lamprey attack. Several rainbow actually took anglers' lures during the treatment. Aquatic worms were killed by the chemical but the damage to insect larvae and other forms of stream life was negligible.

The test was carried out by the U. S. Bureau of Commercial Fisheries as part of the lamprey control program of the Great Lakes Fishery Commission.

Further testing will be carried out during the summer on larger streams where application will be more difficult. Should these tests continue to prove successful, the chemical technique will assume an important role in the early control of the sea lamprey which has destroyed lake trout in Lakes Michigan and Huron and is now rapidly reducing stocks of trout in Lake Superior.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, JUNE 1958, P. 29.

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SURVEY OF WESTERN LAKE ERIE CONTINUED BY M/V "CISCO:" Studies on the life history of 15 important species of fish in western Lake Erie were continued by the Great Lakes Fishery Investigations research vessel Cisco. The major objective of the work by the Cisco during 1958 is to obtain as much information as possible concerning spawning habits, egg survival, hatching, fry survival, and early life history of the fish in western Lake Erie.

Cruise 1 (March 24-April 8, 1958): A record ice jam in southern Lake Huron caused a three weeks' delay in moving the Cisco from its winter base in Bay City, Mich., to Lake Erie. Thus cruise 1 was entirely eliminated and cruise 2 was late in getting started.

Cruise 2 (April 15-18): During this cruise, 4 special trawling stations, designated as "index" stations, were established. These stations will be visited several times each year to gather data that may be useful for predicting future abundance of marketable fish. The Cisco joined the Musky and an outboard motorboat in the "index" trawling operations. The "index" stations are located north of Stony Point, Mich., north of Bono, Ohio, east of South Bass Island, and east of Cedar Point, Ohio. Limnological data including water, plankton, and bottom samples were also collected at these stations.



CISCO, RESEARCH VESSEL OF THE SERVICE'S GREAT LAKES FISHERIES INVESTIGATION.

In addition to the "index" fishing, the Cisco also trawled in areas southeast of the Detroit River Light, south of Middle Sister Island, and north of Lorain. A catch of more than 5,000 smelt was made in one 10-minute drag near the Detroit River Light, but otherwise catches were generally light. Yellow perch predominated in most cases. Smelt catches were usually small because the majority of this species were in inshore spawning areas. Most of the smelt and perch taken were either in spawning condition or were freshly spent. The catches also included mooneye, white sucker, carp, emerald shiner, spottail shiner, silver chub, channel catfish, brindled madtom, burbot, trout-perch, white bass, walleye, blue pike, johnny darter, log-perch, and sheepshead. The mature walleye were ripe or nearly so. Emerald shiners were the only species found off the bottom in any numbers. They were, in fact, apparently more numerous near the surface than near the bottom. A small plankton net attached to the trawl took no fish larvae.

A moderate degree of thermal stratification which had developed in the western basin of Lake Erie was broken up by high winds toward the end of cruise 2. Surface temperatures ranged from 6.2° C. to 13.7° C. (43.2° F. to 56.7° F.), except for somewhat higher temperatures at the mouth of the Raisin River.

Only common names will be used in the cruise reports. The following are common and scientific names of fish that will probably be taken in Lake Erie this year:

Common Names	Scientific Names
Alewife	<i>Alosa pseudoharengus</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Blue pike	<i>Sizostedion vitreum glaucum</i>
Brindled madtom	<i>Noturus miurus</i>
Brown bullhead	<i>Ictalurus nebulosus</i>
Burbot	<i>Lota lota</i>
Carp	<i>Cyprinus carpio</i>
Channel catfish	<i>Ictalurus punctatus</i>
Channel darter	<i>Percina copelandi</i>
Cisco (lake herring)	<i>Leucichthys artedii</i>
Emerald shiner	<i>Notropis atherinoides</i>
Gizzard shad	<i>Dorosoma cepedianum</i>
Goldfish	<i>Carassius auratus</i>
Johnny darter	<i>Etheostoma nigrum</i>
Lake sturgeon	<i>Acipenser fulvescens</i>
Logperch	<i>Percina caprodes</i>
Mooneye	<i>Hiodon tergisus</i>
Rock bass	<i>Ambloplites rupestris</i>
Sand darter	<i>Ammocrypta pellucida</i>
Sheepshead (fresh-water drum)	<i>Aplodinotus grunniens</i>
Silver chub	<i>Hypopais storeriana</i>
Slimy muddler (sculpin)	<i>Cottus cognatus</i>
Smallmouth bass	<i>Micropterus dolomieu</i>
Smelt	<i>Osmerus mordax</i>
Spoonhead muddler (sculpin)	<i>Cottus ricei</i>
Spottail shiner	<i>Notropis hudsonius</i>
Stonecat	<i>Noturus flavus</i>
Trout-perch	<i>Percopsis omiscomaycus</i>
Walleye	<i>Sizostedion vitreum vitreum</i>
White bass	<i>Roccus chrysops</i>
White crappie	<i>Pomoxis annularis</i>
Whitefish	<i>Coregonus clupeaformis</i>
White sucker	<i>Catostomus commersoni</i>
Yellow perch	<i>Perca flavescens</i>

Cruise 3 (May 6-19): Regular trawling stations in western Lake Erie east of South Bass Island, south of Rattlesnake Island, northwest of Pelee Island, south of Kingsville (Ontario), southeast and southwest of the Detroit River light, northeast of Monroe (Michigan), southwest of West Sister Island, south of Middle Sister Island, east of Sandusky (Ohio), and north of Lorain (Ohio), were visited during cruise 3. Tows will be repeated at these stations to follow changes in the distribution and composition of fish stocks. Limited trawling was also done in Sandusky Bay. Catches in nearly every case were predominately smelt and yellow perch. Emerald shiners, spottail shiners, and trout-perch were also taken often in large numbers. Species less common in the catches were silver chub, channel catfish, white bass, walleye, and sheepshead, and the rare species included alewife, white sucker, goldfish, carp, brown bullhead, stonecat, burbot, logperch, river darter, sauger, rock bass, white crappie (Sandusky Bay only), and northern muddler.

The majority of the mature smelt and yellow perch had spawned, but a few were still gravid or ripe. Walleyes had completed spawning. None of the other species, except a single northern muddler, appeared in a spawning condition.

Most of the smelt were in the 5- to 6-inch size range, and a sizable portion of the yellow perch ranged from 5.5 to 7.0 inches in length. Small catches of year-old smelt and yellow perch sug-

gest the possibility of a poor hatch of these species in 1957, but it is too early in the season to be certain.

At the beginning of the cruise an appreciable smelt die-off (probably post-spawning mortality) was in progress. The dead and dying fish were badly fungused. By the end of the cruise, however, the mortality seemed to have run its course. The unaffected smelt showed a striking postspawning improvement in condition during the two-week period.

A few fish fry were taken in plankton nets towed at various depths alongside the boat or attached to the headrope of the trawls. The fry have not been positively identified as yet, but appeared to be smelt.

During the warm, still weather which prevailed toward the end of the cruise, the water in western Lake Erie became thermally stratified and surface water temperature rose rapidly. Surface temperatures rose from a low of 9.0° C. (48.2° F.) at the beginning of the cruise to a high of 20.0° C. (68.0° F.) at the end of the cruise.

The Cisco participated in a synoptic survey of western Lake Erie on May 13, 14, and 15. Two other vessels (the Service's M/V *Musky* and the and the SP-2 from the Ohio Division of Wildlife) cooperated in these surveys. Similar synoptic cruises will be repeated in midsummer and fall this year. Each vessel took surface water samples and temperatures at 2-mile intervals. Drift bottles were released at a number of points. Bathymograph casts were made at 4-mile intervals aboard the Cisco. Analyses for total alkalinity and turbidity were made on most water samples taken by the Cisco.

Extensive meteorological observations were made. These included wind velocity and direction, wet and dry bulb temperatures, and barometric pressure. An anemometer was recently installed aboard the Cisco for accurate wind velocity readings. Weather data will be related to information collected at shore stations to determine how weather influences the lake, and the effect of the lake on weather conditions over land.

Preliminary analysis of the turbidity and total alkalinity values provides evidence that the main current of the Detroit River outflow passed between Middle Sister Island and West Sister Island on May 13 and 14. Water of considerably higher turbidity and alkalinity was encountered immediately south of West Sister Island. This is probably Maumee River water. Some shift in currents, which appears to be associated with a shift in wind direction from NE. to NW., was noted on May 15. Detroit River water extended 2 miles below West Sister Island and Maumee River water occurred in a narrow band along the south shore.

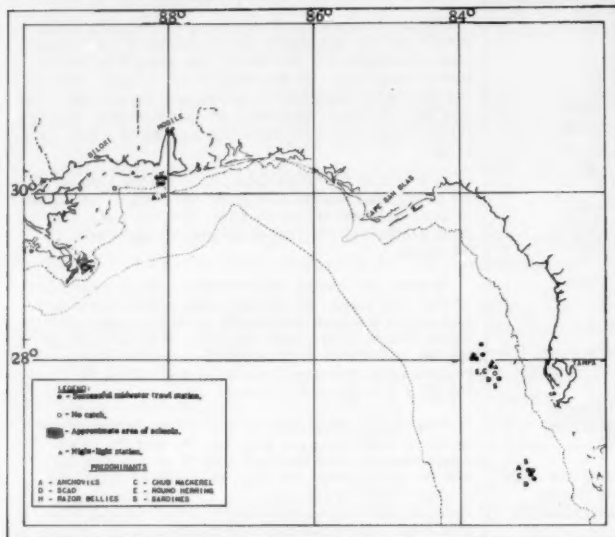
NOTE: PREVIOUSLY DESIGNATED CRUISE NUMBERS AND THEIR RESPECTIVE DATES WILL REMAIN UNCHANGED IN ORDER TO PREVENT POSSIBLE CONFUSION AND SCHEDULE CONFLICTS AMONG AGENCIES COOPERATING IN SEVERAL FUTURE PROJECTS FOR WHICH DATES HAVE BEEN SET.



Gulf Exploratory Fishery Program

EXPLORATORY SURVEY OF SARDINE-LIKE FISHES IN GULF OF MEXICO (M/V *Oregon* Cruise 49): Along the west coast of Florida, from Cape San Blas to Ft. Myers Beach between the 10- and 30-fathom curves, extensive mid-water schools were located by a cruise (completed April 24, 1958) of the U. S. Bureau of Commer-

cial Fisheries vessel Oregon. Sampling of these schools with a 40-foot nylon mid-water trawl caught primarily small round herring (*Etumeus teres*), and lesser amounts of anchovies (*Anchoa* sp.), chub mackerel (*Scomber* sp.), and spanish sardines (*Sardinella anchovia*). The largest catch in this area was 100 pounds in a 30-minute tow. Echo-sounder recordings, however, showed very heavy concentrations of fish, indicating that the net was not positioned properly or that the fish were avoiding the net.



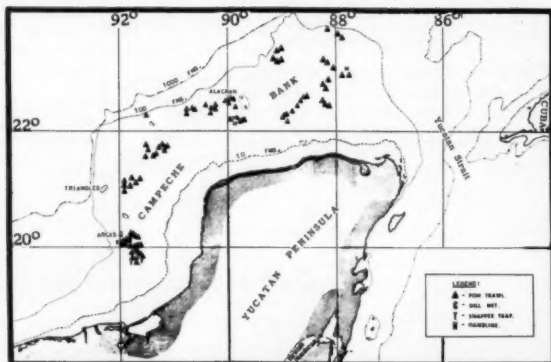
M/V OREGON CRUISE 49 (APRIL 3-24, 1958).

but became heavily concentrated at depths of 5 to 10 fathoms immediately after sunset and remained schooled at these depths until dawn. During the dark of the moon also, large quantities of these fish, attracted to a 1,000-watt light shortly after sunset, would remain all night and begin milling shortly before dawn. These were sampled with a lampara net and found to be composed of the same species as the mid-water trawl catches.

The last three days of the cruise were spent surveying between Pensacola and the Mississippi Delta, in depths of 5 to 20 fathoms. Small anchovies were found in 7½ fathoms off the north end of Chandeleur Island. Razorbellies (*Harengula pensacolatae*) which were abundant in this area during February and March were not located on this cruise.

RED SNAPPER EXPLORATORY TRAWLING TRIP ON CAMPECHE BANK (M/V Silver Bay Cruise 8): To locate suitable trawling grounds and to attempt bottom trawling for red snapper on Campeche Bank, the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay conducted a 23-day cruise which ended May 20, 1958.

Best fishing was south and southeast of Cay Arcas, in 20-35 fathoms. During 5 days of operation (33 drags), 4,600



M/V SILVER BAY CRUISE 8 (APRIL 28 TO MAY 20, 1958).

pounds of snapper and 700 pounds of grouper were caught with the trawl in this area. The best individual tow caught 870 pounds of snapper and 50 pounds of grouper. Trawling in the area east of the Triangles resulted in 2 snapper catches of 245 and 248 pounds. Catches to the north and east across the Bank produced catches varying from zero to 100 pounds. The average tow ran 1 to 2 hours, depending on bottom conditions.

A total of 90 exploratory drags was made. A small, heavy-duty, New England-style fish trawl was used on 81 drags. In spite of several hang-ups on rocks, there was no serious gear damage during the entire trip. The net had a 52-foot headrope and 72-foot footrope, and was made of $\frac{3}{16}$ " diameter braided nylon twine, $4\frac{1}{2}$ " stretched mesh in the body, and 5" stretched mesh in the cod end. The footrope was rigged its entire length with 20" diameter rollers and 38 trawl plane floats were spaced along the headrope. Eight-foot bracket doors were fished 10 fathoms ahead of the wings. Towing was carried on at half speed due to the small size of the net.

The performance of the otter-trawl gear was considered to be excellent, with only occasional slight tears in the netting. It was found that with the exception of scattered high "peaks" which can usually be avoided, the red snapper grounds of Campeche are, for the most part, trawlable with this type of gear.

During the trip, 9 experimental snapper traps were set, but only 1 was successful. In this case, the trap took 13 red snapper (about 2 pounds each) after 2 days in



FIG. 2 - A CATCH OF RED SNAPPER AND SOME GROUPER IN THE COD END OF THE TRAWLING NET, WHICH IS BEING HOISTED ABOARD THE EXPLORATORY FISHING VESSEL SILVER BAY. THE VESSEL WAS FISHING ON CAMPECHE BANK.

the water. Another trap caught a 12-pound grouper after the same length of time.

One set was made with a sink gill net. The net was fished on the bottom for 24 hours and caught one 3-pound lane snapper, but had been badly fouled by a 12-foot tiger shark and a 150-pound sting ray.

The total snapper catch of 5,542 pounds was comprised of 10 species, with red snapper and lane snapper accounting for approxi-

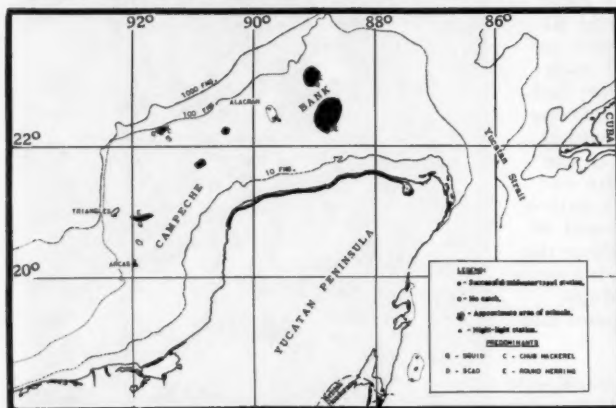
Table 1 - Weight Tabulation of Snapper and Grouper Catch by M/V Silver Bay Cruise 8				
Species		Weight		
Latin Name	Common Name	Total	Average	Range
			(Pounds)	
Snappers and Related Fish:				
<i>Lutianus aya</i>	Red snapper	1/3,298	5	1-27
<i>Lutianus synagris</i>	Lane snapper	7/1,043	2	1-4
<i>Lutianus analis</i>	Muttonfish	1/ 879	12	3-20
<i>Lutianus cyanopterus</i>	Cuban snapper	55	20	15-25
<i>Lutianus griseus</i>	Gray snapper	30	2	1-4
<i>Lutianus apodus</i>	Schoolmaster	58	8	6-30
<i>Lutianus buccanella</i>	Blackfin snapper	14	6	3-8
<i>Lutianus vivianus</i>	Silk snapper (yellow-eye)	7	7	7
<i>Ocyurus chrysurus</i>	Yellowtail snapper	1/ 98	1	1-4
<i>Rhomboplites</i> sp.	Vermillion snapper	60	1	1-2
<i>Lachnolaimus maximus</i>	Hogfish	41	9	3-12
Total snapper		5,542		
Groupers and Related Fish:				
<i>Epinephelus morio</i>	Red grouper	870	12	3-20
<i>Epinephelus nigritus</i>	Warsaw grouper	12	12	12
<i>Epinephelus guttatus</i>	Red hind	2	2	2
<i>Epinephelus striatus</i>	Nassau grouper	8	8	8
<i>Epinephelus microlepis</i>	Gag	60	8	2-16
<i>Mycteroperca phenex</i>	Scamp	143	4	3-6
<i>Mycteroperca falcata</i>	Scamp	8	4	4
<i>Mycteroperca bonaci</i>	Black grouper	274	15	10-30
<i>Promicropus itata</i>	Spotted jewfish	515	257	150-365 (2)
Total grouper		1,892		

1/DOES NOT INCLUDE LARGE NUMBERS OF LESS THAN 1-LB. FISH.
NOTE: FOR THE MOST PART, MINIMUM SIZES OF SNAPPER CAUGHT WITH THE 5" STRETCHED MESH COD END WERE $\frac{3}{4}$ TO 1 POUND. THE NUMEROUS SMALLER FISH WERE CAUGHT WHEN A 2" STRETCHED MESH LINER WAS USED FOR SAMPLING PURPOSES.

mately 80 percent of the catch. The grouper catch of 1,892 pounds contained 9 species. For the most part, minimum sizes of snapper caught with the 5" stretched mesh cod end were $\frac{3}{4}$ to 1 pound.

* * * * *

SURVEY OF MIDWATER SCHOOLING FISH CONTINUED IN GULF OF MEXICO (M/V Oregon Cruise 50): From May 12-23, 1958, the southern Gulf, from the northern shelves off the north coast of Yucatan to Arcas Reef on the Campeche Bank, was extensively investigated by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon, but only light signs of midwater schools were observed. Best



M/V OREGON CRUISE 50 (MAY 10-27, 1958).

indications were found about 40 miles NE. of Alacran Reef in 25-30 fathoms where wide-spread, but loosely aggregated schools, were observed at night. Sampling of these schools resulted in small (up to 150-pound) catches, consisting predominately of 6-8-inch round herring (*Etrumeus*) with a few scad (*Decapterus*). Further south only occasional light tracings were obtained and sampling efforts were generally unproductive. A few catches indicated that some of these tracings were squid. On one occasion a school of chub mackerel surrounded the vessel at the end

of a drag, but sounded and apparently scattered when the vessel resumed towing operations.

Relatively heavy bottom schools were noted on the recorder over most of the area indicated, but could not be sampled with the trawl. Attempts to attract schools to night lights were uniformly unsuccessful.

The period of May 24-27 was spent in surveying the area of the north Gulf between South Pass, Mississippi River Delta, and the north end of Chandeleur Island. Again, only occasional schools were recorded, although fairly heavy concentrations of razorbellies were observed one night in 8-10 fathoms of water. One drag, in 10 fathoms southeast of Chandeleur Island, caught 150 pounds of mixed chub mackerel, cigarfish, and small butterfish, but a large part of the catch was lost through tears in the trawl.

In both areas schools were seen on the recorders primarily at night.



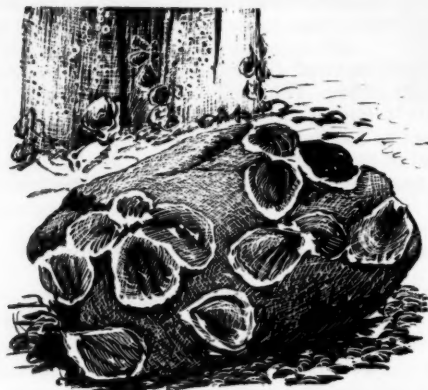
Maryland

CONTRIBUTION OF SHELL PLANTINGS TO OYSTER PRODUCTION: Shells planted by State and private agencies in Maryland waters provide suitable "cultch" (oyster shell thus far has proven to be the most practical cultch under Maryland conditions). Cultch is a biological necessity for the survival of baby oysters. Fertile oyster eggs de-

velop into tiny free-swimming larvae that travel with the tides for about two weeks. At the end of this period they must cement themselves ("set") on a firm object, usually an old shell or a living oyster, that will support them above the bottom. They are unable at this stage to survive in or upon the layer of silt that exists even in firm bottom. Upon

cementing themselves they make certain body changes (metamorphoses) through which they become the oyster with which we all are familiar. Without suitable cultch no young oysters can be produced.

Bare shells obviously cannot receive a set of young oysters or "spat" unless oyster larvae occur in the water where they are planted. This means that there must be brood oysters to produce enough larvae for satisfactory setting. In some areas brood oysters have become extremely scarce. In other areas there are abundant brood oysters but the larvae become so scattered through strong tidal mixing that few are left over the bar where cultch is available. At times quantities of barnacles, Bryozoa, and many other forms of attached marine growth, as well as silt, may cover the shell surfaces before the oyster larvae are ready to attach. These and other factors greatly influence the quantity of oyster set upon the shells and at times may prevent any set at all.



OYSTER SPAT (MAGNIFIED MANY TIMES) ON SMALL PEBBLE.

Before man began to harvest them, all oysters completed their lives and died upon the bottom where they had set. Their shells thus continuously added to the cultch upon the oyster bed. Continued and intensive harvesting has interrupted this natural accumulation and, as older shells broke down or were silted over, many former oyster beds now have very little suitable cultch upon them. Where it is known that larvae will set in sufficient quantity, and it is decided to utilize the local set for a crop of adult oysters, then shells can be planted directly upon the beds and left there for maturity of the set that they receive. Where it is known that oyster setting is sparse, or almost absent, shells can first be planted elsewhere where the rate of setting is known to be unusually high. Areas of this nature are called "seed areas." After the spat have attached, the shells are taken up and planted as "seed" on beds where they are to grow to maturity. Production based upon seed oysters has the advantage of even-aged crops in the right concentration but involves more expense because of the transplanting from seed areas to growing areas.

Yields from private shell plantings can easily be measured by the books of the planters, but yields

from plantings on public bars are difficult to measure since the crops produced are usually combined with those from natural or unplanted areas. It is possible, however, to judge the expected yields by applying a knowledge of the normal natural setting rate where the shells are planted, the rate of growth, and the average normal mortality. We know that it takes 350 oysters of $3\frac{1}{2}$ -inch length to fill a bushel. In most places a $3\frac{1}{2}$ -inch size is reached at a little over three years of age or during the third autumn season. The normal death rate among young oysters seldom exceeds 10 percent per year after the first autumn (when the set is counted) under most Maryland conditions. Also clean shells planted at the beginning of the summer will usually catch about four times as many spat as will old cultch. Oyster research studies have produced a reasonably good picture of the average rate of setting on old or natural cultch in most Maryland waters during the past 15 years. By applying the above knowledge we can calculate how long it will take to produce a bushel of marketable oysters from a bushel of planted shell under various rates of setting on natural cultch. Thus it will require an average setting rate on old cultch of about 125 spat per bushel (equivalent to 500 spat per bushel on clean shells) to produce a bushel of $3\frac{1}{2}$ -inch oysters on planted shells by the third season, or about 45 per bushel to produce the same amount within 10 years, and at a natural setting rate of only 20 spat per bushel it would take about 24 years for a bushel of $3\frac{1}{2}$ -inch oysters to have been produced for one bushel of shell. The above figures apply only to early summer planted shells on hard bottom. Shells that settle in the bottom or become badly fouled before any oysters set will produce much less.

Since the average amount of oyster set varies greatly throughout the State, and from year to year, the relative success of shell plantings can be expected to show great differences. Large areas along the western side of the Chesapeake Bay and in the upper portion of certain major rivers have been found to average less than 20 spat per bushel and shell plantings can seldom pay in such locations. Other large areas with slightly higher sets require fairly long periods for the shells to pay for themselves, while in a few areas, mostly certain tributary waters, sets of 125 or more are normal and here shell plantings sometimes produce excellent yields. There have been numerous instances of individual failures and marked successes. Where to locate specific shell plantings, and whether or not to use shells for seed production or direct yields, are decisions that involve many practical and political considerations. For over a century the original oyster beds of Maryland were stripped of oysters and shell before any attempts at rehabilitation were made and the decline in production was rapid. The combined efforts of State and private planting at present cover only a small percentage of the acreage of charted and potential oyster bottom. Without the shell plantings of the past quarter century, however, Maryland oyster production would have fallen much below its present level. Continued efforts in the increased and most effective use of oyster shell and of substitute cultch, both by the State and private planters, constitutes an essential step in the building up of Maryland oyster production. (March-April 1958 Maryland Tidewater News of the Maryland Department of Research and Education.)

* * * * *

MARKETING CHANGES AFFECT FISHERIES CATCH IN 1957: Two changes in marketing have affected Maryland's ocean fisheries, according to Maryland's Chesapeake Biological Laboratory. This observation was made after analyses of the records returned by licensed commercial fishermen and cooperating dealers and a field survey of the Ocean City fisheries.

One change involved industrial fish production. Traditionally, the ocean fishermen return "trash" or industrial fish to the water, as they have been considered worthless. During 1957, however, a processor at Bishopville, Md., started utilizing for byproducts industrial fish and scrap from fishery plants. Several fish trawlers from Ocean City supplied industrial fish to this processor. The 1957 catch of industrial fish from these trawlers amounted to over 5 times that of 1956, while the 1957 value was over 12 times that of 1956.

The second change, that of a lower demand, caused declines in surf clam fishing, due to internal changes of the industry, rather than to any depletion of surf clam beds. The records indicate that the surf clam beds can support the same amount of fishing as practiced since 1953, because catches were maintained at high levels by the active dredgers. The 1957 total catch and wholesale value, nevertheless, amounted to approximately three-fourths of the 1956 totals.

Records also indicate a decrease of 7 percent in total fisheries production during 1957 and 9 percent in value as compared with 1956. These fluctuations appear to be normal for the ocean fisheries and the totals approximate the average of the last 13 years (base years 1944-1956). The species catch in pounds and value of croaker, gray sea trout, and surf clams reflected this apparent general decline, while 1957 totals for bluefish, fluke, spot, sea bass, industrial fish, and conch showed apparent rises.

Officials of the Chesapeake Biological Laboratory feel that the market for industrial fish can probably be expanded greatly at Ocean City, Md. A plant near Ocean City should result in higher prices to the fisherman since transportation costs of raw fish would be effectively reduced.



North Atlantic Fisheries Exploration and Gear Research

HARD-SHELL AND SURF CLAM EXPLORATION STARTED BY M/V "SUNAPEE": The vessel *Sunapee* has been chartered by the U. S. Bureau of Commercial Fisheries to conduct a survey of hard-shell and surf clam resources in Nantucket Sound and adjacent areas. Operations were scheduled to begin on June 2, 1958, and continue through the months of July and August, using a conventional commercial-type jet dredge. The purpose of the survey during the three-month period will be to undertake the location of new grounds and to determine the commercial potentiality and abundance of hard-shell and surf clams that may be available in those areas. This exploratory survey program was recommended by the Atlantic States Marine Fisheries Commission.

The majority of exploration time will be spent in Nantucket Sound, and the surf-clam phase of the survey will be conducted in the offshore area surrounding the Sound, using the same jet-dredging methods.

Oceanographic and biological information, as it pertains to the survey, will be collected. Progress cruise reports, reviewing general exploratory findings, will be issued monthly.

LAUNCE OR SAND EEL EXPLORATIONS OFF NEW ENGLAND COAST INITIATED: In order to initiate exploration for commercial concentrations of launce or sand eels (*Ammodytes* sp.) off the New England coast, the Bureau of Commercial Fisheries chartered trawler Metacomet departed from East Boston during the week of May 19, 1958. The Metacomet was to utilize a fine mesh otter trawl of a design now used in the Holland and Denmark sand-eel commercial fisheries.

A commercial reduction fishery now exists off the coasts of Holland and Denmark for sand eels, and in 1957 over 75 million pounds were caught by small and medium draggers from April through July. This fishery has developed since 1953, when the Danes first started to fish the sand-eel resource with phenomenal success. The fish meal and oil product of this fishery is said to be of unusually fine quality.

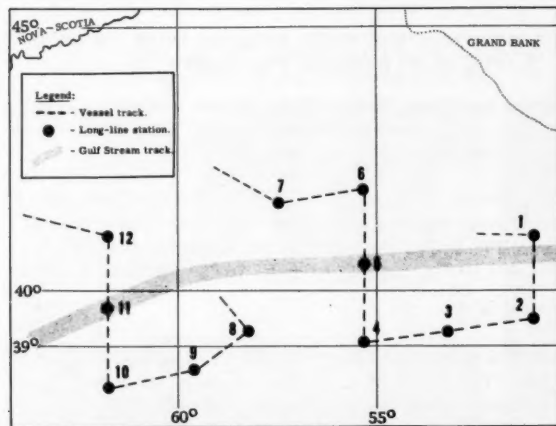


SERVICE'S RESEARCH VESSEL METACOMET.

Since sand eels are known to exist off the coast of New England in substantial quantities, the exploratory and gear tests should give further information on the commercial possibilities of this type of fishery in the New England area.

* * * * *

TUNA FISHING EXPLORATIONS IN WESTERN NORTH ATLANTIC CONTINUED (M/V Delaware Cruise 58-2): This cruise is the first tuna long-line exploratory cruise of the 1958 season and continues the program initiated in 1957 to investigate the pelagic offshore resources of the western North Atlantic.



M/V DELAWARE CRUISE 58-2 (APRIL 16 TO MAY 14, 1958).

Mexico, was used on all stations. The normal exploratory set during this cruise was 60 baskets (1 basket--826' long, 10 hooks per basket). On all sets frozen sea herring

Over 11 tons of bluefin tuna (*Thunnus thynnus*) were landed at 2 exploratory long-line stations during this Delaware cruise. Twelve exploratory stations were fished in a 76,000-square-mile area of the North Atlantic, extending from south of the Grand Banks to the Gulf Stream track and westward to an area southeast of Georges Bank. This marks the first time this area has been investigated for subsurface pelagic resources and during this exploratory cruise approximately 15 tons of tuna were taken.

Tuna long-line gear, of nylon construction, similar to that being used commercially in the Gulf of

(Clupea harengus) was used as tuna bait. No gear was reported lost during the cruise.

Bluefin was the primary tuna species taken during the cruise, with an occasional capture of yellowfin tuna (Thunnus albacares) and skipjack (Euthynnus pelamis). The major captures of bluefin were made on stations 11 and 14 utilizing 60 baskets of gear at each station. The size of bluefin tuna averaged about 175 pounds each on station 11, and 130 pounds on station 14. A total of 79 bluefin--the largest number captured--were taken at station 11, equalling 13 fish for each 100 hooks.

Surface water temperatures ranged from 62° F. in the area south of the Grand Banks to 73° F. in the area of 38°26' N. latitude, 59°40' W. longitude with principal catches of bluefin tuna being made in the areas where the surface water ranged from 66° F. to 73° F. Bathythermograph casts were made at all fishing stations and the results are being analyzed by the Woods Hole Oceanographic Institution.

Incidental species taken during the long-line operations consisted of 13 blue sharks (Prionace glauca), 11 lancetfish (Alepisaurus ferox), 1 white-tipped shark (Pterolamiops longimanus), and 1 silk shark (Eulamia floridan). No white or blue marlin were taken during the cruise.



North Atlantic Fisheries Investigations

HADDOCK SAMPLES COLLECTED FOR ECOLOGICAL STUDIES (M/V Silver Mink): During a one-day cruise (May 12, 1958), the U. S. Bureau of Commercial Fisheries chartered vessel Silver Mink made observations and collected data for the haddock ecology study. The area covered by the cruise included the Highland Grounds north-northeast of Cape Cod Light, in 58-64 fathoms. The area fished was 2½ miles wide (east to west) and 4½ miles long (north to south). Three tows were made with an otter trawl having a 1½-inch mesh cod end liner. Two bathythermograph lowerings were made. All species were identified and enumerated in one sample tow and the important species were measured. A sample of dabs was collected for age and growth studies.

The total of 315 haddock taken was measured and scale samples were obtained from 84 male and 59 female haddock. A total of 53 haddock was tagged.

In a sample of 52 male and 48 female haddock, fish weight, liver weight, gonad weight and state of development, and drumming muscle length, weight and color were recorded. Scales, fin rays, and stomach contents were collected.

Red hake were most abundant in the catch; whiting, haddock, and dabs were next in order of abundance. Compared to previous cruises the average size of haddock was larger and there was a marked increase in the number of whiting captured. A few haddock were in spawning condition but the greater majority were spawned out.

* * * * *

LIFE HISTORY STUDIES OF VARIOUS SPECIES OF INDUSTRIAL FISH AND SCALLOPS INITIATED (M/V Jacquelyn): The first of a series of regular monthly trips using the U. S. Bureau of Commercial Fisheries chartered vessel Jacquelyn began on May 21, 1958. These one- and two-day trips were designed to obtain periodic data for life history studies of various species of industrial fish and scallops.

Although fog hampered operations for most of the trip, a considerable amount of sampling was done and a bed of scallops was located for year-round study.

Samples of scallops, red hake, scup, fluke, and yellowtail were brought back to the Woods Hole laboratory for detailed study.

UNDERWATER TELEVISION RESEARCH OFF CAPE COD (M/V Albatross III Cruise 109): Underwater television research on the Cape Cod fishing grounds was conducted by the U. S. Bureau of Commercial Fisheries research vessel Albatross III on a three-day cruise that ended April 24.

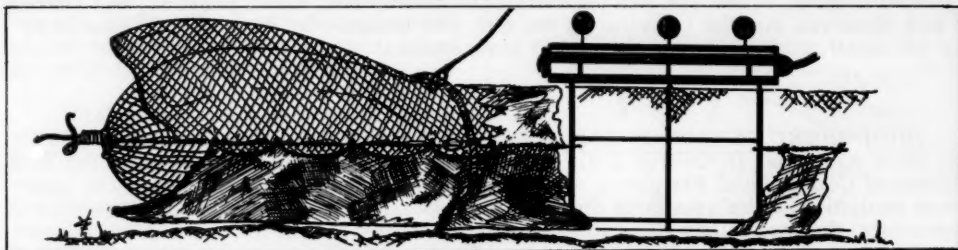


FIG. 1A - TELEVISION CAMERA RIGGED TO STUDY THE EFFECT OF CHAFING GEAR ON ESCAPEMENT FROM THE COD END.

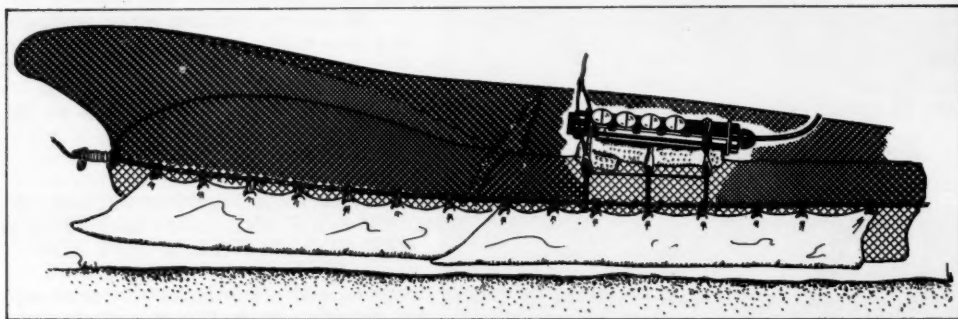


FIG. 1B - TELEVISION CAMERA RIGGED ON TOP OF COD END TO OBSERVE FISH BEHAVIOR INSIDE THE COVER.

The research was concerned with the possible future use of television as a tool for estimating sizes of populations of fish. The area off Cape Cod was selected for

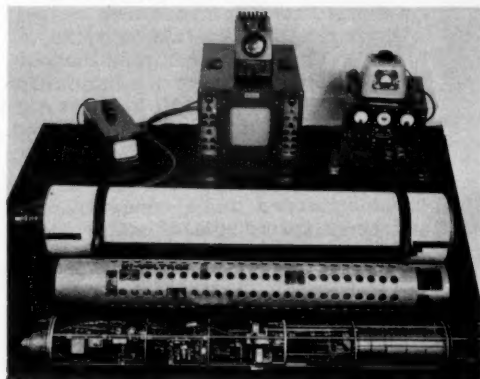


FIG. 2 - UNDERWATER TELEVISION EQUIPMENT. TOP: LEFT & CENTER--5" & 17" MONITORS; RIGHT--POWER SUPPLY UNITS. CENTER: CAMERA HOUSING UNITS. BOTTOM: CAMERA COMPONENTS.



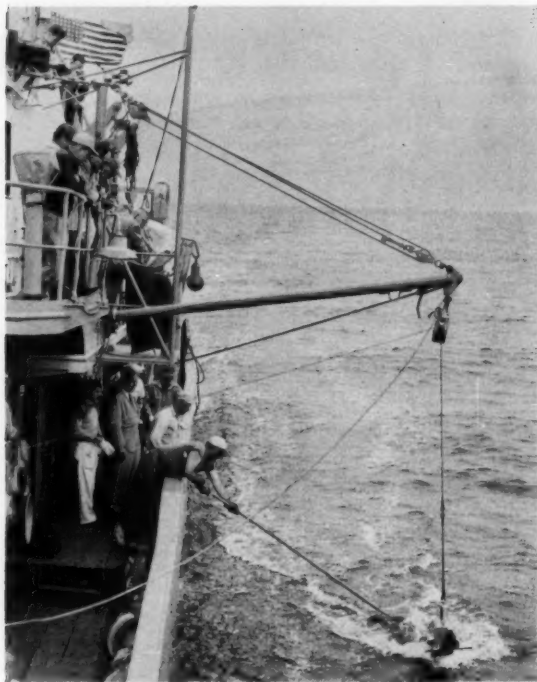
FIG. 3 - LOWERING UNDERWATER TELEVISION CAMERA DURING NIGHT OPERATIONS.

the clearness of the water at this time of the year. Unfortunately, the weather was bad and artificial lights were necessary to see the fish with the television camera.

The television camera was fastened in the cod end of the net so that the behavior of the captured fish could be observed. In two of the experiments, holes (9 and 22 inches) were left in the ends of the nets so that the fish could escape. Surprisingly, none of the fish caught made any serious attempt to leave through these back doors. In all likelihood, this was due to the effect of the artificial light used. The fish caught included dogfish, blackback and yellowtail flounders, cod, small haddock, and herring. It was observed that the behavior of the fish was affected by the turbidity caused by the net itself, especially when towed at slow speeds.

* * * * *

HIGH-SPEED PLANKTON SAMPLER AND MULTIPLANE KITE OTTER TESTED (M/V Albatross III Cruise 110): This cruise (completed May 8, 1958) of the U. S. Bureau of Commercial Fisheries vessel Albatross III was made principally to calibrate equipment to be used with the Miller hi-speed plankton sampler. A new type of depressor, the multiplane kite otter, was used. Using $\frac{1}{4}$ -inch wire and this depressor, the wire curve was computed for speeds of 5, 7, and 10 knots, at depths of 50, 75, and 150 meters. The Miller sampler was tested at the same time.



HAULING IN THE HARDY PLANKTON RECORDER.

A search for fish eggs and larvae was made with a one-meter net. A concentration of eggs and/or larvae of haddock, cod, cusk, plaice, and rockling was found on the southeast part of Georges Bank.

* * * * *

VERTICAL DISTRIBUTION OF FISH EGGS AND LARVAE STUDIED OFF GEORGES BANK (M/V Albatross III Cruise 111): Horizontal high-speed plankton tows were made at 2-hour intervals for a period of 48 hours in the South Channel and in the southeast part and southwest part of Georges Bank during this cruise of the U. S. Bureau of Commercial Fisheries research vessel Albatross III (completed May 28, 1958). The depths sampled ranged from zero to 75 meters. In addition 96 bathythermograph lowerings were made and 450 drift bottles released.

Larval haddock, cod, and flounder were fairly abundant and in general appeared to be concentrated at the 10-meter level in water deeper than 60 fathoms and at the 20-30 meter level in water of less than 60 fathoms.

North Pacific Exploratory Fishery Program

COMMERCIAL SHRIMP CATCHES OFF COAST OF WASHINGTON (M/V John N. Cobb Cruise 37): Additional shrimp fishery grounds with good commercial fishing possibilities were found off the coast of the State of Washington by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb during a four-week cruise that ended on May 23, 1958. The grounds discovered by the vessel were in areas unexploited by commercial shrimp fishermen.

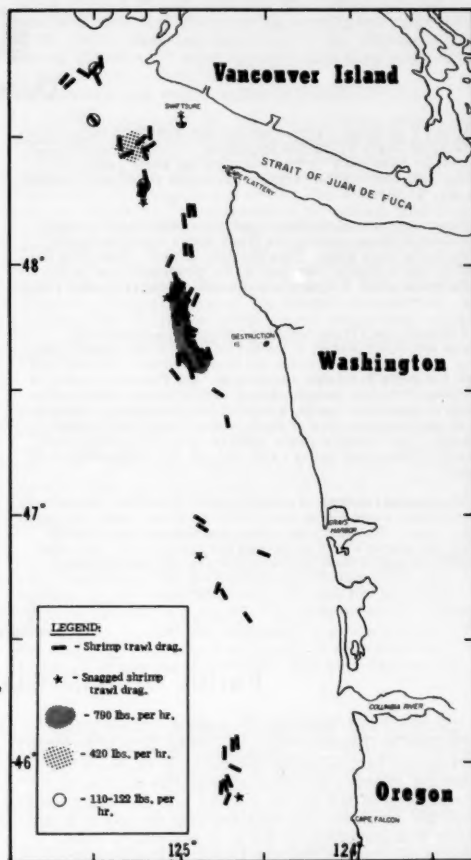
Best catches of "cocktail" size pink shrimp were made in the area between Destruction Island and Quillayute (see chart) at depths from 60-68 fathoms. Depths between 64 and 67 fathoms produced consistent catches at a rate of 400 to 1,500 pounds per hour. The discovery of this ground extends the present area of commercial fishing about 18 miles further to the north.

Six drags made about 20 miles west of Cape Flattery, Wash., at depths from 68 to 107 fathoms caught shrimp at a rate of 290 to 630 pounds per hour, and averaged close to 300 pounds per hour. Pink shrimp caught in this area were larger and averaged about 85 to the pound (heads on), however, a considerable amount of incidental fish were mixed with the shrimp. Incidental fish catches consisted of Pacific ocean perch, Dover sole, smelt, turbot, black cod, and other flatfish.

A number of drags were made in deep water at depths from 100-200 fathoms in an attempt to locate the larger side-stripe shrimp. No commercial quantities of the species were located, although one 30-minute drag made northwest of Swiftsure Lightship yielded a catch of 30 pounds. These shrimp averaged about 35 to the pound heads on).

A total of 66 drags was made during the cruise at depths ranging from 49 to 203 fathoms. The area of operations included the offshore waters between Cape Falcon, Ore., to the Swiftsure Lightship, northwest of Cape Flattery. All drags, each of 30 minutes duration, were made with a 43-foot Gulf-of-Mexico flat-type shrimp trawl.

This cruise by the Bureau's exploratory fishing vessel was the second in a series of shrimp surveys being conducted in the North Pacific during 1958. The first exploration revealed good commercial beds of "cocktail" size pink shrimp off the northwest Oregon coast. Further explorations this year will be undertaken along the central and southern coasts of Oregon and in the Kodiak-Cook Inlet area of Alaska. These surveys are being made in cooperation with the fisheries agencies of Washington, Oregon, and Alaska.



M/V JOHN N. COBB CRUISE 37 (APRIL-MAY 1958).

Throughout the cruise records were maintained on bottom water temperatures, bottom type, organisms encountered, etc., which may be helpful in defining the typical environmental conditions prevailing in areas where concentrations of shrimp are located. Samples of shrimp were also taken for laboratory study.



Oysters

HEAVY SPRING RAINS THREATEN VIRGINIA INDUSTRY:

Effects of heavy rains and excessive runoff this spring may be felt by Virginia's oyster industry for some years to come, biologists at the Virginia Fisheries Laboratory stated on May 8, 1958.

Excessive rainfall in the James River watershed already has pushed large amounts of fresh water over the oyster bars in the seed area. This stretch of river, from Hog Island to the bridge at Newport News, provides most of the seed oysters for Virginia's multimillion dollar oyster industry.

Although the Virginia oyster thrives in a mixture of ocean and river water, it cannot tolerate fresh waters very long. When waters become too fresh, oysters close up and wait for more favorable conditions. But there is a limit to the time they can remain closed, and this time shortens as water temperature rises. For over two weeks many oysters on beds in the upper half of the seed area have been denied a taste of salt water. Some oysters have died already and runoff from recent heavy rains has not yet reached the seed area.

In the upper reaches of the seed area, in places like Deep-water Shoal, some oysters are killed by fresh water almost every year. But this year some deaths have occurred already on nearly every important bar in the river. State biologists fear that, unless dry weather arrives immediately, a

catastrophe may occur. Even if the situation becomes no worse than it is at present, they expect a shortage of seed oysters next fall.

Another important oyster area that can be affected is the Rappahannock River. Conditions there are not yet as serious as in the James, and if a dry spell develops, the industry may escape damage. Laboratory biologists are keeping a close watch on conditions in the Rappahannock.

Oystermen in Maryland also are concerned about possible effects of fresh water. The Susquehanna River is dumping unusually large amounts of fresh water into the upper bay. Recent surveys have shown that some of the tributary rivers are saltier than the Bay, a very unusual situation. If this condition persists for any considerable time, the rivers could quickly become fresh for their entire lengths.

Like many clouds, this one has a silver lining. Fresh water also kills barnacles, mussels, and other organisms that foul oyster shells and interfere with setting and growth. No less important is the effect on oyster drills or screwborers, a serious oyster enemy that cannot tolerate fresh water as well as the oyster can. Removal of fouling, pests, and enemies can improve conditions for oyster setting and growth. Freshets, though they may cause serious temporary damage, often are followed by unusually good sets and by greatly improved oyster harvests for a few years. This has been the experience in the Rappahannock River during the past oyster season, following the disastrous mortalities of 1955.



Pacific Oceanic Fishery Investigations

CHARTS OF MONTHLY MEAN TEMPERATURES FOR NORTH PACIFIC SURFACE WATERS:

A program of preparing and issuing charts which show the monthly mean temperatures for the surface waters of the North Pacific and the anomalies from the mean for the mid-ten-day period of each month was initiated by the U. S. Bureau of Commercial Fisheries Pacific Oceanic Fishery Investigations (POFI) in Honolulu. The anomaly charts revealed that the surface temperatures during 1957 were consistently warmer than normal over vast areas of the eastern North Pacific, a report on POFI activities for the first quarter of 1958 reveals.

Beginning with January 1958, sea surface temperature charts of the northeastern Pacific were issued for the mid-ten days of each month for both 1957 and 1958. In addition, anomaly charts for the particular month for both years from the 30-year mean and of 1958 from 1957 were prepared. These charts showed that during the 1957 January-March period, the coastal waters between 35° N. and 45° N. were colder than normal and the offshore waters were generally warmer (to 6° F.) than normal. During the first quarter in 1958, somewhat the opposite situation existed--the entire coastal area was warmer than normal while the offshore areas showed a progressively increasing amount of colder than normal areas.

EQUATORIAL TUNA STUDIES: The survey phase and the processing and analysis of the data for POFI's two-year study of the abundance and distribution, and variations therein, of the tuna resources of French Oceania continued during the first quarter of 1958.

A definite seasonality of occurrence of surface tuna schools about the Marquesas Islands was confirmed by the results from two cruises made to the area during the quarter. Surprisingly consistent results were obtained from the standardized inshore surveys.

Seasonality of Occurrence of Surface Tuna Schools about Marquesas Islands

Date	Number of Tuna Schools Sighted
September 1956 .	40
January 1957 . .	87
February 1957 . .	79
October 1957 . .	34
November 1957 .	41
January 1958 . .	76
March 1958 . . .	90

In order to determine the role of the Marquesas group as a concentrating mechanism for surface tuna schools, a broad survey coverage offshore from the Marquesas, scheduled for repetition dur-

ing each subsequent cruise, was begun in November 1957. Results from two such surveys and part of a third, which was under way in the first quarter of 1958, indicate that surface tuna schools are about three times more available in offshore waters during the Marquesan summer.

To date, stomachs from 243 skipjack caught in Marquesan waters have been examined. This study of the food habits of the Marquesan skipjack showed a preponderance of fish in their diet. Fish comprised 65 percent of the food items, crustaceans 30 percent, and the molluscs 5 percent. Of the food fishes, 22 families have been identified, and of the latter, 16 are primarily families of reef-inhabiting forms. Of the crustaceans, the stomatopods were the most numerous. Thus the production of reef fauna appears to play an important role in the diet of the Marquesan skipjack.

HAWAIIAN SKIPJACK STUDIES: Skipjack tagged in Hawaiian waters during the summer and fall of 1957 continued to be recaptured and returned to the POFI laboratory at Honolulu, although the rate of recovery was considerably below that reported for the previous quarter (213 recoveries). A total of 46 tagged fish was recovered bringing the over-all recovery rate to 9.1 percent. Recoveries were made in the areas in which the fish had been released as well as in other areas of the fishery, with certain exceptions. The recoveries do indicate, however, that a large portion of the fish tagged last season are resident in Hawaiian waters and that a group of fish tagged at any one location may disperse throughout the body of fish contributing to the Hawaiian fishery. An important exception to these statements are fish tagged near Kauai. Very few of these fish have been recovered, and only one to the east of the tagging area.

Catches of skipjack during January by the Hawaiian fleet were high, in fact landings during the month were higher than for any previous January. During February and March, landings dropped to more normal low levels.

The collection of temperature records and salinity samples from shore based-monitoring stations continued. As compared with the same period in 1957, temperatures at Koko Head, Oahu, were about the same. Salinities, on the other hand, were noticeably higher than in 1957, reaching the highest level since observations were started in November 1955. This is a continuation of the high level which started during the last quarter of 1957.

ALBACORE TUNA PROGRAM: Work under the albacore tuna project during the first quarter of 1958 was confined to laboratory analysis of the data presently at hand. Biological work included the beginning of the analysis of data pertaining to the general population of fish north and northeast of the Hawaiian Island chain, and the herbivore-predator relation in the plankton for the central North Pacific. Oceanographic work consisted of a continuation of the analysis of the chemical and physical data from the central North Pacific and the preparation of the current series and historical series (1957) of sea surface temperature charts from ship's weather reports for the middle 10 days of each month.

Data on the ecology of the albacore tuna to date reveal the general distribution of the albacore and its movements as shown by tagging, temperature, and productivity. The hypothesis relative to the migration suggested by the data is that there are three groups of fish with the one containing the smallest size fish performing a complex migration to the west coast and then back to the Japanese winter fishery. It also appears that this migration is acted upon independently by the environments of the eastern and western North Pacific.

Northeastern Pacific albacore survey data were examined in regard to the distribution of the three major size-frequency curves of albacore. The small fish were taken in the warmer portion of the temperature range occupied by the albacore. The number of these "noncommercial" small fish that appear in the catches of the northern United States west coast is determined by the temperature of the tongue of warm water which progresses northeastward into the area during spring and late summer. When the temperature of the tongue reaches or exceeds 62° F. large numbers of small-size albacore may be expected to appear off Oregon and Washington.

The recovery of only one tagged albacore was reported during the first quarter of this year. It was recovered on November 17, 1957, by a Japanese long-liner at 38°08' N., 174°53' E. exactly one year after its release from the POFI research vessel Charles H. Gilbert at 36°44' N., 127°37' W. During this period it had gained approximately 15 pounds.

It appears that the albacore are found in those regions where the herbivore-predator ratio is around 20 to 1 and that they are not found in the regions of ratio maxima. This replaces the more narrow belief that the albacore are associated with the Calanus population although it appears that Calanus is the most common and abundant herbivore.

TILAPIA STUDIES: The efficiency of the Hawaiian skipjack fishery is affected, in part, by an inadequate supply of natural bait. The species of natural bait presently available have a low survival potential in the baitwells. POFI is presently working towards a possible alleviation of these problems by studies of the potentialities of tilapia as a substitute bait. In the tanks at the Honolulu laboratory, young tilapia are being produced primarily for the purpose of physiological and ecological studies. The production in these tanks dropped considerably during the first quarter of 1958 (winter months) with monthly totals of 35, 3,181, and 7,952 fish. We continue to be plagued with mortality from a sporozoan parasite. Potassium permanganate, copper sulphate, and pyridylmercuric acetate were used as germicides on the living fish, with the latter being considered as most effective. Formalin sterilization of the tanks proved to be an effective measure.

Another and more ambitious study of tilapia, particularly the economics of commercial production of bait-size tilapia and the use on commercial vessels, is a cooperative program managed and operated by POFI on the island of Maui. During

the quarter, tanks were stocked and a full-time fishery biologist stationed at the site. In January, an estimated 5,000 tilapia were transported to Maui and from these 500 adult males and 1,500 adult females were segregated as a brood stock. Eighteen young appeared on February 20, and during successive weeks 768, 8,288, 5,060, 3,188, and 2,855 were produced.

There was evident mortality among the young resulting from predation by dragonfly larvae. This, and other problems (such as increasing the early morning supply of dissolved oxygen in the

tanks and devising increasingly efficient methods for removing the young fish from the brood tanks) are receiving attention.

To further augment POFT's studies concerning an economical and efficient substitute for natural bait, a contract with the Territorial Fish and Game is presently being negotiated for a program of rearing tilapia in natural ponds. Also, a biologist is being added to the staff for the period of the Hawaiian summer skipjack fishery. He will observe the reactions of the tilapia under conditions of commercial fishing aboard the local sampans.

* * * * *

PRODUCTION OF TILAPIA FOR TUNA BAIT CONTINUES SATISFACTORILY:

The production of tilapia for use as bait fish in live-bait fishing for skipjack continued satisfactorily during the month, according to May 1958 news notes issued by the Pacific Oceanic Fishery Investigations of the U. S. Bureau of Commercial Fisheries, Honolulu, Hawaii. The cooperative tilapia rearing plant on the Island of Maui experienced some mortality through disease, but some 30,150 fry were produced during the month and by the end of May a total of 62,000 fry in 14 tanks was on hand. At the laboratory site the production of young fry improved with a recruitment of 21,350 during the month, making a total production of 214,000 tilapia fry since the project was initiated. Total fry on hand at the end of the month was 35,300.

HAWAIIAN SKIPJACK TAGGING PROGRAM: The Hawaiian skipjack tagging program for this year got under way in May with the charter of two sampans by the Pacific Oceanic Fishery Investigations in Honolulu. The *Buccaneer* experienced a main engine breakdown and it was not until May 26 that she was able to operate. Nevertheless in the next few days her crew tagged about 2,000 small skipjack near the Island of Kauai. The other sampan, the *Corsair*, completed her charter on May 16 with a total of 2,001 skipjack tagged off Hilo, Hawaii. Of this total only 230 fish were considered season fish (20-22 pounds) while most of the balance were in the 4-pound class. At the end of the month 234 of the tagged fish had been recovered. Two of last year's tagged fish were also recovered near Hilo. These fish, when tagged in September 1957, weighed 4 pounds but scaled 11 pounds when recovered.

* * * * *

SURVEY OF MARQUESAS ISLANDS FOR TUNA RESOURCES CONTINUED (M/V Hugh M. Smith Cruise 43): The U. S. Bureau of Commercial Fisheries research vessel *Hugh M. Smith* completed another in a series of cruises to the Marquesas Islands for a survey of surface schools of tuna. The vessel departed from Honolulu on January 3, 1958, and returned on February 25, 1958. In addition to the search for surface schools of tuna, 12 monitoring stations were occupied off the Island of Oahu and other physical and biological data were collected.

Inshore Survey: A total of 29 schools of skipjack were sighted, 11 were chummed, and 4 were fished. The catch was 416 3- to 6-pound skipjack of which 274 were tagged. Four schools of mixed skipjack and yellowfin were sighted and chummed, but the catch from the single mixed school fished was only 9 5.5- to 7.5-pound skipjack and a single 9-pound yellowfin. Two schools of 30- to 50- pound yellowfin were seen and chummed unsuccessfully. Of 41 unidentified schools seen, one was chummed with its identity unestablished. In general, the schools were wild, easily dispersed, and most numerous near islands.

Offshore Survey: A total of 34 schools of skipjack were sighted, 21 chummed, and 8 fished. The catch consisted of 344 4- to 7-pound skipjack and 300 16- to 29-pound skipjack. Of the 644 fish caught, 336 were tagged. Two mixed schools of

skipjack and yellowfin were seen of which one was chummed and fished, producing a catch of 92 fish (35 fish tagged). Of 38 unidentified schools seen, 8 were chummed with no catch being made.

Of the 74 schools seen on the offshore survey, 25 were sighted on the north leg, 22 on the east, 14 on the south, and 13 on the west. Dividing each leg into inner, middle, and outer portions (75 miles each) gives a school distribution of 27 (inner), 17 (middle), and 30 (outer) sightings for the entire survey. Skipjack of 16-29 pounds were frequently seen on the outer portions of each leg, whereas in the inner portions the fish were mostly of 4-6 pounds.

In addition to the schools listed above, the following were sighted on the runs to and from the survey center to baiting sites: 5 skipjack, 1 yellowfin, and 18 unidentified. One school of skipjack and 3 of unidentified tuna were sighted on overlaps between day's runs on the offshore survey. None of these schools was chummed.

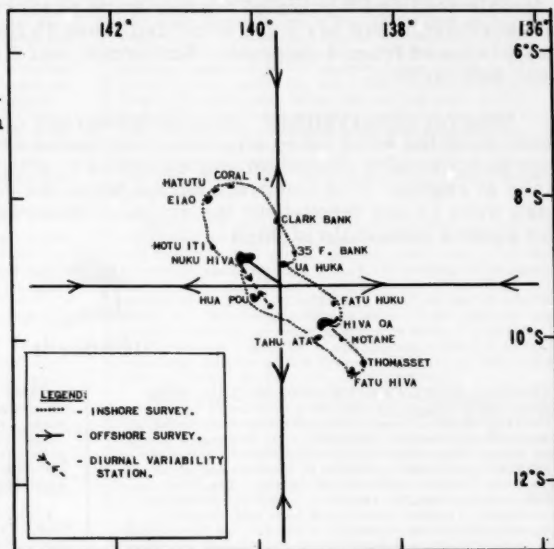
Bait: The vessel carried 32 buckets of nehu and 2 of acclimatized tilapia on the run to the Marquesas. Surface schools of equatorial tuna could not be fished because of the death of the bait prior to reaching the grounds.

A total of 722 buckets of Marquesan sardines (*Harengula vittata*) was collected along with small quantities of non-bait species. Of this amount, 652 buckets were captured in daytime sets and 70 buckets at night. Taiohae and Haka Ui (Nuku Hiva) provided 388 and 204 buckets, respectively, while Hanga Haa and Haka Puuae (Nuku Hiva), Taa Huku (Hiva Oa), and Hananai (Ua Huka) furnished small quantities of bait. Sardines were scarce or absent at Haka Tea, Houmi, Anaho, and Hatiheu (Nuku Hiva), Haka Nai (Hua Pou), and Hananui, and Val Take (Ua Huka). Bait was nowhere sufficiently abundant to warrant the use of a receiver.

Included in the above figures are 230 buckets of sardines collected for introduction into Hawaiian waters. Survival of this bait was fairly good, and 148 buckets were released at Ewa, Oahu, on February 25, 1958.

The sardines collected behaved well as chum but may have been slightly too large for the smaller skipjack fished. Sardines larger than 120 millimeter fork length were common, with many of these being ripe or spawned females. Length-frequency and gonad condition were recorded from 25 sardines from each of the larger sets, and a representative sample of sardines was preserved from each baiting locality. Experiments showed the Marquesan sardine to have a broad salinity tolerance.

Plankton and Night-Lighting: Ten half-hour, 0-140 meter plankton tows were made at night on the run to the Marquesas, and 10 on the run back to Honolulu. Twenty-two 0-140 meter tows (2 per night) were made on the offshore survey, and 12 more were taken on the diurnal variability station. Ten half-hour surface tows



M/V HUGH M. SMITH CRUISE 43 (JAN. 3-FEB. 25, 1958).

were made with an Atlas flowmeter and 4 using a Rigosha flowmeter; all surface samples were frozen. Twenty-five nonquantitative plankton samples were taken with a 45-centimeter net from sardine-baiting sites. Two night-light stations were conducted in the Marquesas.

Specimens Preserved: In addition to the above, the stomachs from 5 male and 5 female tuna and 5 pairs of ovaries were preserved from all schools fished. Length measurements and sex were recorded from 25 fish per school. Frozen blood serum was prepared from 4 skipjack. Numerous reef fish were collected by seine, hand-line, and barter.

General Observations: Bathythermograph casts and surface salinity and phosphate samples were taken as prescribed in the cruise plan. The thermograph was kept in continuous operation and annotated frequently. Weather observations were made at regular time intervals except when the vessel was in bays. Four trolling lines were in use throughout the cruise. Records were kept of tuna schools, birds, and aquatic mammals sighted.



Standards

FEDERAL IDENTITY STANDARDS PREVAIL OVER LOCAL FOOD REGULATION: In a case involving most of the large meat packers, a Magistrate in the City of Newark, N. J., recently held that a City Ordinance and State Statute requiring that all ingredients be shown on food labels, could not be applied to products for which there were Federal standards of identity. The City Solicitor had brought an action to compel the listing of ingredients on canned corned beef hash and chopped ham, even though the standards of identity for these products in the Federal meat inspection regulations specifically provide that the ingredients need not be shown on the label.

The principal issue in the case was whether Federal laws have pre-empted the field of food regulation, thereby preventing the enforcement of local laws that prescribe more stringent requirements for the labels and contents of food products. This doctrine of Federal pre-emption is derived from the "supremacy clause" in Article VI of the Federal Constitution, which provides:

"This Constitution, and the Laws of the United States which shall be made in pursuance thereof, and all treaties made, or which shall be made, under the authority of the United States, shall be the supreme law of the land; and the judges in every state shall be bound thereby, anything in the constitution or laws of any state to the contrary notwithstanding."

In oral argument before the Magistrate, counsel for the meat canners called attention to several state decisions and opinions supporting the supremacy of Federal laws in this area. He also cited numerous decisions of the Supreme Court of the United States striking down state laws that conflict with or infringe on the policy of Federal laws. At the conclusion of the argument the Magistrate dismissed all of the complaints against the packers on the ground that the Federal Meat Inspection Act and Regulations covered the labeling of meat products and the "supremacy clause" prevented the enforcement of more restrictive state laws.



Tuna

NEW DEVELOPMENTS IN FREEZING TECHNIQUES ON PURSE SEINERS: During 1957 a new method for freezing tuna on vessels was developed by a practical Pacific Coast fishing vessel engineer with 14 years of experience in the use of standard coil and brine-freezing systems. The system has been installed and used for six trips since the first of 1957 and in at least one of the trips the system was subject to a severe test. Since the standard-type coil system does not have the capacity to freeze large lots of fish without auxiliary ice, purse-seine vessel owners are enthusiastic about the possibilities of the new system.

Many tuna purse-seiners equipped with the standard coil system were faced with a costly job of converting their vessels to a brine-freezing system or being forced out of the highly competitive tuna fishery. This new system, which according to reports, can be installed for \$10,000 or less on vessels with coil equipment, would make it possible for these tuna purse-seine vessels to compete with the vessels equipped with a brine-freezing system. The problem that has plagued tuna vessels equipped with a standard coil refrigeration system has been one of enough refrigeration capacity to refrigerate a large tonnage of fish under the handicap of high water and air temperatures.

According to the inventor, "the new refrigeration system is essentially a brine system which builds a reserve of ice to meet refrigeration needs with a minimum of machinery." He also states that further experimentation is necessary before the most efficient installation can be developed.

At the present time the system has been installed aboard the *Jo Ann*, a standard Pacific coast-type purse seiner with a length of 79.3 feet, a beam of 22.4 feet, and a draft of 10.3 feet. The capacity of this vessel prior to the installation of the new system was 110 short tons of frozen tuna. With the new system, the capacity is only slightly less.

The system consists of the standard type ice machine and coils. The regular coils have been augmented by a smaller coil which is placed just above the regular coils. Water is circulated and sprayed on the refrigerated coils, gradually building up a large mass of ice as much as 1 foot in diameter on the refrigerated coils. The entire hold has been made into a watertight compartment. Prior to the catching of fish, the ice-making machinery is put in operation, and ice is built up around the coils. The fish are placed in the hold after they are caught, and brine water is released into the watertight hold. The ice (which was built up around the coils) melts, and cools the brine water. The cold brine

water is then circulated to freeze the fish. In addition, more water is sprayed on the pipes where the ice has been built up, and as this cold water drips on the fish it also chills the fish. The addition of catches on top of already-frozen fish seems to have no effect, the frozen fish being sufficiently cold so that they are not thawed. In fact, the ice that has been built up on them is helpful in cooling the brine water which is being circulated to freeze the new catch.

Benefits to be anticipated with the new freezing system:

(1) Efficiency will be increased in loading and unloading because the fish can be brought aboard and stowed below in about half the time required on a standard coil vessel. This is an extremely valuable factor when the fish are schooling as at that time every hour gained can be worth days and even weeks of searching. In this new method, the fish are brailed directly from the water into the hold through the hatch or the manholes, instead of being first brailed on the deck and stowed below later, as is the custom in the vessels equipped with standard coil systems.

(2) The quality of the fish will be better because it will be in the hold and under refrigeration in about half the time previously taken. When one considers that on the fishing grounds the water temperature is often as high as 85°-90° F., with an air temperature of from 100° to 120° F., speed in getting the fish under refrigeration as rapidly as possible is vital.

(3) The back-breaking work of going below and icing fish, which is necessary in vessels equipped with standard coils, is virtually eliminated. Now only 1 or 2 men go below when the fish are being brailed into the hatch, and these men simply steer the fish so that they lay fore and aft. The *Jo Ann's* hold is divided into three compartments extending fore and aft for the full length of the storage space. These three compartments keep the fish from rolling about in the hold and damaging themselves or possibly piling up on one side of the vessel and causing a list. The compartments also aid in unloading, as one compartment can be completely unloaded to the bottom of the compartment, and then it is much easier to unload the other two on either side. Formerly, when the fish were brailed on deck, it was necessary for at least 8 men to go below, break loose the ice that was carried by the vessel, and then have the fish passed down to them through manholes or the main hatch. The fish were then stowed in bins which were made of removable planks. Generally a layer of fish was stowed, and a layer of ice shoveled on top of them. This process continued until that bin was filled, and proceeded from bin to bin until the vessel was fully loaded. Due to the cramped quarters in which the men worked, and the large quantities of ice which were carried, there was much shifting of ice from bin to bin and a great deal of manual labor. All of this work has been eliminated and the physical efficiency of the crew is not taxed as heavily, with the result that the crew will be able to concentrate their physical activity on capturing fish when they are running. In the past after a heavy set crews would be exhausted and would have to rest rather than fish available schools. There is also the possibility that 1 or

2 men can be eliminated from the crew. This would result in an increase of earnings for the remaining crew members, and would amount to from \$75 to \$100 a crew member per trip for each man less.

Since installing this new system, the *Jo Ann* made three trips in the early part of 1957 with the following results:

Trip 1: The length of the trip was 65 days. The trip was made during the early part of the year when fishing was spotty. The vessel came in with a short load, 79,070 pounds of yellowfin tuna, 8,405 pounds of skipjack. Rejects amounted to 775 pounds of raw skipjack, 980 pounds of raw yellowfin, and 1,890 pounds of cooked skipjack. The catch was small and rejects were a little higher than the purse-seine average, but the crew felt that this was due mostly to mishandling on their part because of unfamiliarity with the new system. The equipment was not considered fully tested, but from the experience gained some modifications were made before the second trip.

Trip 2: The length of the trip was 24 days. Fishing was conducted off Cabo San Lucas, the tip of Lower California, and vicinity. The vessel came in with a load of 120,560 pounds of yellowfin tuna and 56,145 pounds of skipjack. Rejects amounted to 180 pounds of raw yellowfin, 1,440 pounds of cooked yellowfin, and 2,880 pounds of cooked skipjack. The average rejects were 2.4 percent as compared to the purse-seine average of about 2.5 percent. The crew felt that most of the rejects were due to their receiving 20 tons of fish from another vessel which had the fish in 80° F. water for over 15 hours.

Trip 3: This was practically a record trip. The vessel fished on the West Coast of Lower California and returned with a full load in 8 days. Due to unloading difficulties, the vessel waited 20 days before unloading. The vessel landed 124,075 pounds of yellowfin and 72,815 pounds of skipjack with only 2,875 pounds of raw skipjack rejected. There were no cooked rejects and the raw rejects were caused, according to the crew, to smashed fish due to large catches which prevented good sorting. This trip served as a severe test of the new system of refrigeration, and in the opinion of observers proves that the system is a success.

The principle of this type of refrigeration is not completely new, but the method is probably unique. At any rate it is the first time it has been adapted to a purse-seine vessel fishing tuna. It is also the first time that a converted coil system has been used to refrigerate fish under such warm water and air temperatures. Vessel owners and fishermen are enthused and predict a great future for the system, and as of April 1958 two other purse seiners installed similar systems and one seiner installed it partially.

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* * * * *

YELLOWFIN, SKIPJACK, AND BIG-EYED TUNA FISHERIES TRENDS: Trends in the domestic yellowfin, skipjack, and big-eyed tuna fisheries is the subject of a report submitted to the President and the Congress on May 22 by the Secretary of the Interior Fred A. Seaton.

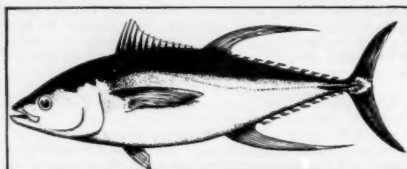
The report was made under provisions of the Fish and Wildlife Act of 1956. Section 9(b) of that Act authorizes the Secretary of the Interior, upon specific request, to determine whether or not there has been an adverse trend in a domestic fishery, and whether or not there has been an increase in imports of a directly competitive product.

The tuna industry, the report points out, is composed of many segments--large canners, small canners, importers, fishermen, and operators of such large vessels

as bait boats and purse seiners and of such smaller craft as albacore trollers. Each group is confronted with different problems, mainly associated with the species involved or the stage at which it handles the tuna.

The report, which presents findings and not recommendations, shows that:

The United States landings of yellowfin and skipjack in 1957 were 237,113,000 pounds, 27 percent below the 1950 peak of 324,711,000 pounds.



Yellowfin Tuna
(*Netothonus macropterus*)

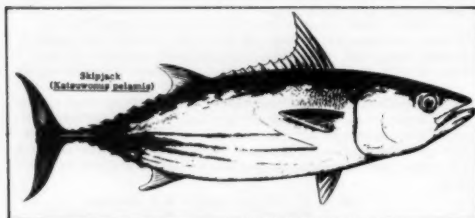
The number of bait boats over 50 gross tons participating in this fishery declined from 210 in 1951 to 146 in 1957, and the carrying capacity dropped from 44,300 tons to 33,875 tons.

The average ex-vessel price for yellowfin declined 25 percent from \$345 per ton in 1954 to a low of \$258 per ton in 1957; that the skipjack price declined 28 percent from \$304 to \$220 a ton in the same period.

The number of employees on bait boats dropped from 2,730 in 1951 to 1,989 in 1956; on purse seiners from 1,661 in 1949 to 827 in 1956.

Imports of all types of tuna (adjusted to whole-weight equivalents) accounted for 6 percent of the available supply of tuna in the United States in 1948, 39 percent in 1956, and 46 percent in 1957.

Imports of all tuna (adjusted to whole-weight equivalents) averaged less than 20 million pounds annually in the 1940's, jumped to 117,100,000 pounds in 1950, and to an estimated 259,600,000 in 1957.



According to the report, such adverse trends as declining landings and lower prices for domestic tuna have been intensified by the general upturn in costs, which has increased the cost of operations for the United States tuna producers. The American fishery must compete with foreign fisheries having lower vessel construction costs, long-term loans at low interest rates, and government subsidies which have facilitated the construction, rebuilding, and insuring of vessels.

While the Japanese high-seas tuna fleet has practically doubled its capacity since 1951, vessel construction in the California yellowfin and skipjack fishery has stagnated and only nine new large vessels have been added to the bait-boat fleet since 1951. As of November 1957, most of the 146 vessels in that fleet were about 13 years old, and owners have had little incentive to make replacements or additions to the fleet.

The tariff rates established by the Tariff Act of 1930 and since modified by trade agreement, are based mainly on the import pattern at that time. The present duty on canned tuna in oil is 35 percent ad valorem; on canned tuna in brine, 12½ percent; on frozen cooked loins and discs, one cent a pound; fresh or frozen raw tuna, no duty. The duty on cooked tuna is equivalent to about 3.3 percent ad valorem.

The report, including several pages of tables and charts, covers such items as the world tuna fisheries, United States tuna fisheries, the Eastern Pacific fishery for yellowfin and skipjack, trends in vessel operations, trends in employment in the tuna fisheries, price trends, effect of imports on domestic prices and operating costs, Japanese production, and the import situation.

United States Fishing Fleet^{1/} Additions

MARCH 1958: A total of 51 vessels of 5 net tons and over were issued first documents as fishing craft during March 1958--10 more than during March 1957.

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, March 1958 with Comparisons					
Area	March		Jan.-March		Total
	1958	1957	1958	1957	
	(Number)				
New England . . .	1	-	3	3	19
Middle Atlantic . .	-	5	3	10	23
Chesapeake	7	5	24	22	104
South Atlantic . .	9	8	32	19	130
Gulf	26	12	61	22	166
Pacific	5	9	18	14	102
Great Lakes . . .	-	-	2	-	8
Alaska	3	2	3	8	48
Puerto Rico . . .	-	-	-	-	1
Virgin Islands . .	-	-	1	-	-
Total	51	41	147	98	601
NOTE: VESSELS ASSIGNED TO THE VARIOUS SECTIONS ON THE BASIS OF THEIR HOME PORTS.					

NOTE: VESSELS ASSIGNED TO THE VARIOUS SECTIONS ON THE BASIS OF THEIR HOME PORTS.

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft, by Tonnage, March 1958	
Net Tons	Number
5 to 9	18
10 to 19	4
20 to 29	3
30 to 39	14
40 to 49	12
Total	51

The Gulf led all other areas with 26 vessels, followed by the South Atlantic area with 9, the Chesapeake area with 7, the Pacific with 5, Alaska with 3 and the New England area with 1 vessel.

^{1/}INCLUDES BOTH COMMERCIAL FISHING AND SPORT FISHING CRAFT.



U. S. Foreign Trade

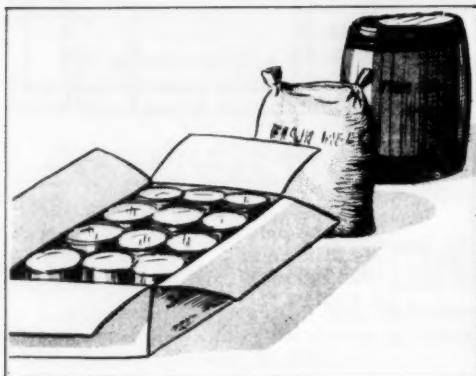
GROUNDFISH FILLET IMPORTS, MAY 1958: During May 1958, imports of groundfish and ocean perch fillets and blocks amounted to 11.0 million pounds. Compared with the corresponding month of last year, this was an increase of 2.3 million pounds (26 percent) according to data obtained from the U. S. Bureau of Customs and published by the Bureau of Commercial Fisheries. Gains of 1.1 million pounds from Iceland and 854,000 pounds from Denmark were mainly responsible for the over-all increase.

Canada continued to lead all other countries exporting groundfish and ocean perch fillets to the United States with 7.6 million pounds during May 1958. Denmark was next with nearly 1.3 million pounds, followed by Iceland with 1.2 million pounds. The remaining 908,000 pounds were accounted for by West Germany, Norway, France, the Netherlands, and the United Kingdom.

Imports of groundfish and ocean perch fillets and blocks into the United States during the first five months of 1958 totaled 56.4 million pounds. Compared with the same period of last year, this was an increase of only 77,000 pounds (less than 1 percent). Shipments originating in Canada comprised 67 percent during the 1958 period, while Iceland made up 19 percent of the total, and Denmark accounted for 9 percent. The remaining 5 percent was represented by West Germany, Norway, Miquelon and St. Pierre, the Netherlands, the Union of South Africa, and the United Kingdom.

NOTE: SEE CHART 7 IN THIS ISSUE.

IMPORTS AND EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-FEBRUARY 1958: In the first two months of 1958, imports of many of the major edible fishery products were slightly behind the same period of 1957. In the two-month period, imports of groundfish filets (excluding blocks) were down 20 percent, frozen tuna 6 percent, canned bonito 31 percent, and lobster 31 percent. Commodities imported in larger amounts during January and February were canned tuna, canned sardines, tuna loins and discs, swordfish, and canned crab meat. Groundfish blocks, shrimp, and canned salmon imports were about the same. Imports of fish meal were about double for the two-month period of 1958 as compared to 1957.



Exports of all major fishery products decreased during the first two months of 1958 as compared with the same period of 1957.

Imports: FROZEN TUNA: During the first two months of 1958, imports were 23.0 million pounds, 6 percent less than in the same period of 1957; most of the decrease was in albacore, "other tuna" increased slightly. Imports from Japan were almost double those of the first two months in 1957, but imports from Peru were 74 percent less.

Tuna loins and discs: Imports for the first two months of 1958 were 2.0 million pounds, or 74 percent more than in the similar period last year. Japan, Peru, and Cuba were the principal sources.

CANNED TUNA: In the first two months this year, 4.5 million pounds were imported, 13 percent more than in the same 1957 period; albacore was down 24 percent and other tuna was up 42 percent.

GROUND FISH: Imports of groundfish (including ocean-perch) filets for January and February 1958 were 13.0 million pounds, 20 percent less than for the comparable period of 1957; blocks were about the same.

SHRIMP: Imports during the first two months of 1958 were 10.2 million pounds, an increase of 2 percent over the similar period of 1957.

CANNED SALMON: For the first two months of 1958, imports of 5.2 million pounds were about equal to those for the same period in 1957.

FRESH AND FROZEN LOBSTER: The January and February imports this year were 6.1 million pounds, a 31-percent decrease as compared with the same months last year. Imports decreased from all major suppliers except the Union of South Africa.

CANNED SARDINES: Total imports for the first two months in 1958 were 5.8 million pounds, an increase of 59 percent as compared with the same period in 1957. The increase was largely of sardines not in oil from the Union of South Africa.

CANNED BONITO: The January and February 1958 imports totaled 2.0 million pounds, 31 percent less than for those months last year.

SWORDFISH: At the end of the first two months of 1958, imports were 16 percent more than at the same time in 1957.

CANNED CRABMEAT: In January and February this year 709,000 pounds were imported, 36 percent more than for the same months last year.

FISH MEAL: Imports the first two months of 1958 were 18,915 tons, 103 percent ahead of the similar 1957 period. Imports from Peru and Angola accounted for the increase.

Exports: CANNED SARDINES: Exports during the first two months of 1958 of 1.7 million pounds were 64 percent less than in that period of 1957. Exports were down to all principal countries of destination, due to the small California sardine pack during the past year.

CANNED MACKEREL: Exports during January and February 1958 were 76 percent less than in 1957, due also to a light pack in California. The principal decline was in exports to the Philippines.

CANNED SALMON: For January and February 1958, exports were 222,000 pounds, 65 percent below that period in 1957.

FISH OIL: For the first two months of 1958, exports were only 14.0 million pounds, 31 percent less than in that period last year. Although exports were less to most markets the first two months of 1958, exports to Canada exceeded those for the entire year of 1957.

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA PROVISIO, JANUARY 1-MAY 3, 1958: The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1958 at the 12½-percent rate of duty has been established as 44,693,374 pounds. Any imports in excess of this established quota will be dutiable at 25 percent ad valorem.

Imports from January 1-May 3, 1958, amounted to 12,490,111 pounds, according to data compiled by the Bureau of Customs.



Virginia

ABUNDANCE OF MENHADEN IN 1959 PREDICTED: Menhaden or bunkers, scarcer in recent years than in the banner year of 1955, may come back in tremendous numbers in 1959, say biologists of the Virginia Fisheries Laboratory, Gloucester Point. They base their opinion on the tremendous abundance of tiny menhaden in Chesapeake Bay and its tributaries this spring.

On a recent survey with experimental trawls, the research vessel *Pathfinder* of the Virginia Laboratory caught large numbers of tiny menhaden, about 1.5-inch long, in the lower part of Chesapeake Bay off the mouth of the York River, and in the York River itself. Baby menhaden also have been observed in tremendous numbers well up the James River.

This trawl catch is quite remarkable, for the meshes of the net are large enough to allow much bigger fish to escape. Small fish are brought on deck with this net only when they are very abundant.

By late summer these young fish, born last fall and winter, will be about 5 inches long. They will begin to appear in pound-net catches in August or September, but will not be caught in any quantity by the menhaden purse-seine fleet until 1959. If present indications are reliable, the early 1960's may rival the mid-1950's in numbers of menhaden caught. In 1955 more than 300 million pounds of these herring-like fish were landed in Virginia--71 percent by weight of the entire Virginia catch of fish and shellfish.

The biologists are careful to point out that the accuracy of this forecast may be affected by many things. "Survival of the fish to commercial size may be poor, or their migrations may carry them to regions inaccessible to the fishing fleet. Nevertheless, in 1951 we predicted good catches ahead on the basis of similar evidence, and this forecast was amply confirmed a few years later."

Virginia and U. S. Bureau of Commercial Fisheries biologists, who are conducting a major investigation of this important fishery, will follow the progress of this new brood of menhaden with great interest. Within a year they should have good evidence as to how abundant these new fish really are.

* * * * *

FRESH-WATER FISH FROM RIVERS TRIBUTARY TO CHESAPEAKE BAY INVADE SALT WATER: Virginia fishermen have seen unusual numbers of carp in the York, Rappahannock, and other Chesapeake Bay tidal waters of Virginia during the spring months of 1958. Biologists of the Virginia Fisheries Laboratory, Gloucester Point, report blue gills, white catfish, and gar caught in traps near the mouth of the York and Rappahannock Rivers.

One of the fishery biologists attached to the Laboratory states, "I do not recall seeing such numbers of fresh-water fish in salt-water areas any time during the past ten years. Fresh-water fish caught in the York River and held in tanks filled with York River water never survive more than two weeks. Under natural conditions these fish must return to fresh water within a relatively short period or die. On the other hand, some common salt-water fishes invade fresh water and live there successfully for weeks or months. Young croakers, spot, and hogchokers are found in the Mataponi and Paumunkey Rivers and occasionally bluefish and flounder stray into fresh water. Salt-water fish can tolerate a longer stay in fresh water than fresh-water fish in salt water. Heavy rains of the past few weeks undoubtedly are responsible for this unusual situation."

* * * * *

UPPER SEED AREA IN JAMES RIVER SUSTAINS HEAVY OYSTER MORTALITY: Unusually heavy spring rains have aroused considerable concern for the seed oyster beds in James River. Oysters are unable to feed in water containing less than one-seventh as much salt as found in ocean water, say biologists at the Virginia Fisheries Laboratory at Gloucester Point. They believe that many oysters above Wreck Shoal Bar in the James River have been deprived of salt water since mid-April. Wreck Shoal is in the middle of the seed area.

The over-all picture at present is one of minor losses in the lower half of the seed area from Wreck Shoal downriver but increasing losses of oysters with distance upriver, report the biologists. Deep Water Shoal, the important last bar upriver, has experienced a mortality well over 50 percent.

Frequent examinations in James River since mid-April have shed new light on the ability of oysters to withstand unfavorable conditions. Oysters tonged from fresh water had no heartbeat when opened and showed no sensitivity.

When placed in salt water, oysters long closed by fresh waters, though seemingly dead, revived quickly. The fine hairs used for pumping water began working within minutes, and feeble heartbeats were detected in ten minutes.

By remaining closed, oysters are able to tolerate fresh water for weeks--if temperatures are not too high and if oysters are slowly acclimated to these conditions, say the biologists. They believe that fat oysters are more likely to survive than poor ones.

Boxes or hinged empty shells appear to be breaking apart rather rapidly thereby destroying the evidence of oyster deaths, but tongers will probably note a scarcity of oysters in the upper seed area next fall.



Wholesale Prices, May 1958

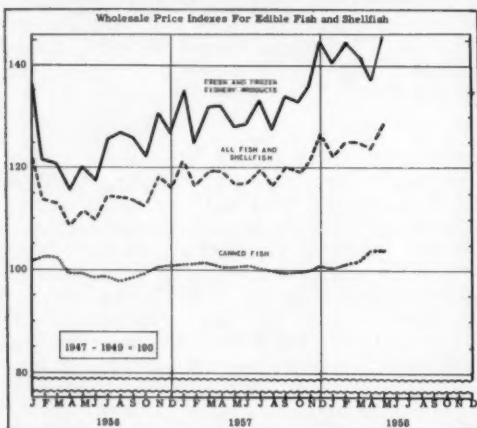
WHOLESALE PRICES, MAY 1958: Because landings were lighter than seasonally expected and because stocks of most frozen products were depleted, the amount of fish and shellfish available was not adequate to meet the needs of the fresh fish market and the processors. The edible fish and shellfish (fresh, frozen, and canned) wholesale

price index (128.6 percent of the 1947-49 average) in May rose 4.6 percent over that for April and was 9.9 percent higher than in the same month of 1957.

All products under the drawn, dressed, and whole finfish subgroup were higher in May than in April. The index for the subgroup rose 20.0 percent from April to May and was 37.4 percent higher than a year earlier. From April to May, prices rose for fresh large offshore haddock at Boston by 25.7 percent, fresh and frozen king salmon at New York City by 20.5 percent, and substantially also for frozen halibut, whitefish at New York City and Chicago, and yellow pike at New York City. Compared with May 1957, prices this May were higher for fresh large offshore haddock by 31.4 percent, for frozen halibut by 19.9 percent, for fresh and frozen king salmon by 23.8 percent, and also for all the fresh-water fish included in the subgroup.

Since the active selling season for oysters ended in April, shucked oyster prices dropped in May and almost offset the increase in the prices for fresh haddock fillets (up 14.5 percent) and shrimp (up 1.1 percent). Prices this May as compared with May of 1957 were lower for fresh shrimp at New York City and shucked oysters, but substantially higher (up 12.5 percent) for fresh haddock fillets at Boston. The subgroup index for fresh processed fish and shellfish was up 0.5 percent from April to May, but was 0.3 percent lower than in May 1957.

Higher frozen shrimp prices at Chicago this May were only slightly offset by lower prices for frozen haddock fillets, while prices for frozen flounder and ocean perch fillets remained steady at April levels. Compared with May 1957, prices this May were higher for frozen ocean perch and haddock fillets, unchanged for frozen flounder



fillets, and lower for frozen shrimp at Chicago. The May 1958 index for the processed frozen fish and shellfish subgroup index was up 1.3 percent from April to May, but down 2.4 percent from a year earlier because the drop in shrimp prices more than offset the rise in ocean perch and haddock fillet prices.

There were no changes in the prices for canned fishery products from April to May, but prices were 3.1 percent

higher than a year earlier more because of a shift in pricing specifications rather than an actual price increase. Compared with May 1957, prices this May were higher for canned tuna, the same for canned pink salmon, but slightly lower for canned Maine sardines. The higher prices for canned California sardines were principally due to a shift in pricing specifications from 48 15-oz. cans per case to 24 15-oz. cans per case.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, May 1958 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices ^{1/}		Indexes (1947-49=100)			
			May 1958	Apr. 1958	May 1958	Apr. 1958	Mar. 1958	May 1957
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					128.6	3/122.9	124.8	117.0
<u>Fresh & Frozen Fishery Products:</u> 2/					146.0	136.4	141.1	128.2
<u>Drawn, Dressed, or Whole Finfish:</u>					148.3	123.6	126.4	107.9
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.10	.08	101.7	80.9	91.2	77.4
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.35	.34	106.7	104.7	99.0	89.0
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.30	.66	179.8	149.2	142.4	145.2
Whitefish, L., Superior, drawn, fresh	Chicago	lb.	.77	.74	190.9	183.4	185.9	166.1
Whitefish, L., Erie pound or gill net, rnd., fresh	New York	lb.	1.00	.68	202.2	136.5	161.8	161.8
Yellow pike, L., Michigan & Huron, rnd., fresh .	New York	lb.	.48	.31	111.4	72.7	158.3	82.1
<u>Processed Fresh (Fish & Shellfish):</u>					142.7	142.0	144.6	143.2
Fillets, haddock, sml., skins on, 20-lb. tins . .	Boston	lb.	.36	.32	122.5	107.2	119.1	108.9
Shrimp, lge. (26-30 count), headless, fresh . .	New York	lb.	.95	.94	150.1	148.5	151.7	151.7
Oysters, shucked, standards	Norfolk	gal.	5.50	5.63	136.1	139.2	139.2	142.3
<u>Processed, Frozen (Fish & Shellfish):</u>					134.1	132.4	140.9	130.9
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.40	103.4	103.4	106.0	103.4
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.34	.35	106.7	109.9	125.6	92.6
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.30	.30	118.8	118.8	118.8	114.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.91	.88	140.0	135.8	144.3	145.8
<u>Canned Fishery Products:</u>					104.3	104.3	101.8	101.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. .	Seattle	cs.	23.00	23.00	120.0	120.0	120.0	120.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.65	11.65	84.0	84.0	82.9	80.8
Sardines, Calif., tom, pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	5.68	5.68	4/132.4	4/132.4	113.8	105.0
Sardines, Maine, keyless oil, No. 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	7.50	7.50	79.8	79.8	74.3	81.9
^{1/} Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices. ^{2/} The index for fresh and frozen fishery products for January 1958 was revised from 137.4 to 140.3 and for February 1958 from 141.4 to 144.9. ^{3/} Revised. ^{4/} Revised to take care of a shift in specifications from 48 15-oz. cans per case to 24 15-oz. cans per case.								





International

FOOD AND AGRICULTURE ORGANIZATION

MEETING ON COSTS AND EARNINGS OF FISHING ENTERPRISES: An international meeting on "Costs and Earnings of Fishing Enterprises" will be held in London, September 8-13, 1958. It was organized by the Food and Agriculture Organization of the U.N. (FAO), Rome, Italy. The 77 Member Governments of FAO have been invited to send experts to it.

"The meeting will focus attention on many questions of crucial interest to all sections of the world's fishing industries and to Governments," according to the Director of the Fisheries Division, FAO. "Governments everywhere are so involved in the maintenance and development of fishing industries that they are directly concerned with costs and earnings, as much so as the employers and employees in the industries. Subsidies, credit schemes, tax and duty concessions, port and shore facilities, insurance, price support, and marketing schemes are some examples of Government participation in the fishing industry.

"This interest, and the naturally keen interest of the fishing industry itself, to investigate costs and earnings has led to much work being done on the subject, especially in the countries possessing important and highly

developed fishing industries. But there has been little collaboration or exchange of ideas and information between the investigators, so they have not benefited from each other's work. The meeting in September will enable the experts on costs and earnings to exchange views and experiences and discuss the methods used to study the subject in various countries."

Experts from North America and North and Northwest Europe, where there is a background of experience of such investigations in government, industry, and economic research institutions, are expected to make the main contributions to the meeting, both in technical papers and in the discussions.

"We are convinced that the problems and difficulties encountered in the investigation of costs and earnings in the fishing industries are in themselves a hindrance to the rational development of fisheries," the Director said. "This meeting should do much to point the way in many countries towards finding the facts about costs and earnings and should help to make possible the planning of realistic programmes for the development of fisheries on a sound, economic basis."

GENERAL AGREEMENT ON TARIFFS AND TRADE

INTERSESSIONAL MEETING OF CONTRACTING NATIONS: In a three-week meeting at Geneva that concluded May 2, the Intersessional Committee of the 37 GATT (General Agreement on Tariffs and Trade) contracting nations carried forward the work of bringing into harmony the trade arrangements of the European Economic Community--which is still in an early formative stage--and the GATT framework of international trade rules and tariff concessions. The Committee also urged the German Government to take further steps to eliminate quota restrictions on imports as that government was no longer entitled under GATT to maintain import restrictions for balance-of-payments reasons.

The Intersessional Committee also held consultations on the intensification of quantitative import restrictions which New Zealand had felt obliged to make because of its worsening foreign exchange situation. New Zealand gave assurances that import restrictions would be relaxed as soon as its financial position improved.

The United States Delegation to the meeting consisted of representatives from the Departments of State, Agriculture, Commerce, Interior, and Treasury.

European Economic Community: The Intersessional Committee reached general agreement that

the normal procedures of the GATT were adapted for consideration of trade questions relating to the European Economic Community Treaty. The representative of the Community undertook to refer the conclusions of the Intersessional Committee to the Council of Ministers of the EEC and to inform the Contracting Parties of the results, a U. S. Department of State news release of May 6 points out.

The problems raised by the association of overseas territories with the EEC were discussed in detail by the Intersessional Committee, which had before it a series of reports on specific commodities and a general report which had been prepared by a working party that met in February and March. These reports and the discussions that have been carried out constitute a substantial accomplishment by the Contracting Parties in their examination of the EEC Treaty. There was considerable support for the view that it would be most fruitful now to direct attention to specific practical problems, leaving aside for a time the questions arising out of differing legal interpretations of the GATT.

The Chairman of the United States Delegation reiterated the importance the United States attaches to the successful evolution of the European Economic Community. He also took cognizance of the desire of contracting parties, including the United States, to move forward as rapidly as possible

in GATT consideration of the EEC Treaty. He noted, however, that firm judgments on some important issues were not practicable because the institutions of the Community were still in the process of organization and much depended on future decisions and actions to be taken by these institutions.

Commenting on the historic importance of the EEC Treaty, the United States representative noted the similarity of the objectives of the General

Agreement and those of the EEC Treaty in relation to the expansion of world trade. In particular, he expressed the view that these objectives would be furthered if the Community set its common external tariff as low as possible. The Community was also requested to make the tariff available as soon as possible, but not later than July 1, 1959, and to supply information to facilitate its study by contracting parties.

INTERNATIONAL LABOR ORGANIZATION

FISHERMEN LABOR PROBLEMS TO BE CONSIDERED AT CONFERENCE:

Approximately 80 nations were expected to have representation at the Conference of the International Labor Organization (ILO), that began on June 4, 1958, in Geneva, Switzerland. Among the problems up for consideration were to be three instruments pertaining to fishermen: (1) Minimum age for admission of fishermen to employment; (2) medical examinations for fishermen; (3) articles of agreement for fishermen employed on fishing vessels.

Other considerations of general world labor importance would be such subjects as hours of work, occupational health services, and conditions of employment for plantation workers. These additional subjects will have some relationship, naturally, to the problems pertaining specifically to fisheries.

The ILO is one of the United Nations specialized agencies. Since its origin dates back to the League of Nations, it is the oldest specialized agency dealing with world problems. Since the beginning of the organization, 107 conventions or treaties have been brought into effect.

Representation in the ILO is most unusual since it is the only organization which is of tripartite character. Each member government has two government delegates, one employer delegate, and one worker delegate. The government delegates speak for their government; employer and worker delegates are independent and may vote independently of their government's position. In the United States, the employer delegates and advisors are selected upon the recommendation to the Government by the U. S. Chamber of Commerce and National Association of Manufacturers. These organizations have requested Charles E. Jackson, General Manager, National Fisheries Institute, Inc., to advise the employer delegate on the fishing instrument questions, and the Government has approved the recommendation.

NORTHWEST ATLANTIC FISHERIES COMMISSION

U. S. S. R. ADHERES TO NORTHWEST ATLANTIC FISHERIES CONVENTION:

The Soviet Union has adhered to the Convention for the Northwest Atlantic Fisheries Convention and is now a member of the Commission. Presumably one or more Soviet representatives will attend the Commission's June meeting, according to the United States Fisheries and Wildlife Under Secretary of State.

SCIENTISTS SHOW HOW TO CATCH MORE FISH

An increase of 25 to 50 percent in the catch of fish can be obtained with fewer boats and fishermen if certain regulations are observed, it is claimed by two young fishery scientists—one from the Fisheries Laboratory, Lowestoft, England, and the other from the Fisheries Division, Food and Agriculture Organization (FAO), Rome.

The commercial application of the prediction methods of these two young men may have a far-reaching, even revolutionary, effect on the fisheries and fishing industry of the world, an FAO news release points out.

The formulae are contained in a 530-page book, "On the Dynamics of Exploited Fish Populations," recently published by Her Majesty's Stationery Office, London, in which the authors set out the methodology of predicting the effects of fishing on fish populations. In doing so, they provide some startling examples of increased catches, savings in men and boats, and increase in profits, which are bound to follow specified regulations of mesh size of nets and reduced fishing effort.

After eight years of work, the authors arrived at formulae which can be used in predicting the effect of any regu-

lation on any fishery in the world, after taking into account such natural factors as the recruitment of fish, their growth, and death.

An example of how such calculations can be made is provided by the demersal fishery in the North Sea. Here, the authors calculate, the best results could be obtained by restricting to half or less the fishing effort made in the immediate prewar period (before 1939) and enforcing a 80- to 90-mm. (3.1- to 3.5-inch) mesh size for trawl nets. If such conditions were imposed, the authors estimate that the catch of demersal fish from the North Sea would increase by 25 percent, or perhaps, 50 percent. In addition, of course, the substantial reduction in fishing effort would result in a very big increase in profits.

The authors calculate that if the fishing effort in the North Sea was reduced to 85 percent of the pre-1939 level and the minimum size of the net mesh was 80 mm. (3.1 inches), the effect would be to increase the size and quality, and therefore, the value of the fish caught. At the present wholesale prices this might mean an increase of more

than US\$2.8 million a year. If similar regulations were enforced in the English west coast hake fishery, the effect would probably be an extra US\$1.4 million earned by the fishermen and vessel owners engaged in the industry. Put in another way, such regulations as these, based on the formulae of the authors, would result in an increase of about a third in the effectiveness of fishing effort as measured by the catch per unit of effort.

If the methods put forward in this book are proved commercially and are adopted throughout the world, the effect is likely to be revolutionary. It would mean, for instance, that in all the countries now seeking to develop their fisheries, a method could be applied to determine the optimum exploitation of those fisheries, providing certain data are supplied. If these data are not available, the authors show how the information required may be obtained; thus it has become possible to predict the yield of any fishery. This is an achievement of the greatest importance to the fishing industries throughout the world, and particularly to underdeveloped countries which are planning to develop their fisheries.



Argentine Republic

TWO PLANTS PRODUCE FROZEN FISHERY PRODUCTS: Two plants in the Rawson Area produce frozen fishery products for sale elsewhere in Argentina and for export. The products frozen, to a considerable extent in newly-installed factories, consist principally of shrimp, fish (pejerrey), and octopi.



Australia

FROZEN FILLETS IMPORTED FROM SHANGHAI: Quick-frozen fillets from Shanghai (Red China) were offered to the Australian fish trade for the first time in February 1958 by an Australian import firm. The fillets (boneless and skin-off) are reported to be attractively packed in 7-lb. blocks. The fillet blocks were sold at about 5.6 6.6 U. S. cents under other imported fish of comparable quality. The fillets offered for sale were yellow croaker (similar to English bream), pomfrets (flatfish), and jewfish.

The Australian importer returned from his second trip to Shanghai in February 1958 and reported that the fish blocks were processed by the China National Foodstuff Export Corporation on the Whampoo River, Shanghai. He stated that the processing plant from a hygienic standpoint was ahead of similar plants in many countries. All of the 1,500 employees of the Shanghai plant wore clean white overalls and a face mask. Visitors to the factory are required to change into a similar outfit.

The importer stated further that the fish-processing machinery had been installed by Danish technicians. These technicians also supervised the packing. The 7-lb. block was developed at the Australian importer's suggestion because the 30-lb. blocks or slabs imported from Japan were too big for the average Australian retailer (Fish Trades Review, February 1958).

JAPANESE PEARL-SHELL FISHERMEN BARRED FROM TERRITORIAL WATERS: Following urgent representation in Canberra by a Western Australian Member of Parliament and the State Fisheries Minister, the Australian Government on April 16, 1958, signified its acceptance of the state view that Japanese pearl-shell fleets should not be allowed to operate in Western Australian waters during the coming season. This naturally gratified Western Australian pearl-shell producers, though it was announced simultaneously that no more than 50 Australian vessels will be licensed for this industry. Since World War II the pearl-shell industry has suffered from reduction in demand, as polyester plastics replaced low-quality pearl shell in button manufacture. Nevertheless, starting from scratch in 1947, procurement of pearl shell from the oyster beds off Broome on the north coast has steadily increased during the same period until it now earns more than a million United States dollars annually.

In 1957, for the first time, a Japanese pearl-shell fleet was permitted to operate off Broome, outside the three-mile limit but over the continental shelf which, Australia claims, defines her territorial waters. Although it cannot be proven that Japanese vessels exceeded their allotted catch of 100 tons, subsequent investigation of the beds gave rise to allegations of "ruthless" overfishing (United States Consul at Perth, April 29, 1958).



Brazil

JAPANESE-CONTROLLED FISHING COMPANY ANNOUNCES PLANS FOR 1958 WHALING SEASON: The Japanese tuna fishing firm established in Pernambuco recently purchased a small Brazilian whaling company. It announced plans to capture 300 whales during the 1958 season. The catch is expected to yield 796 metric tons of oil, 1,350 tons of ground whale meat for animal food, 330 tons of whale meat for human consumption, and 500 tons of bone meal. The whale meat for human consumption is to be preserved by salting and drying. In the next five years the whaling firm expects to increase production about threefold, the United States Consul in Pernambuco states in a May 9, 1958, dispatch.



British Honduras

FISHERY PRODUCTS EXPORTS, 1957: Exports of fishery products from British Honduras during 1957 totaled 375,744 pounds, valued at US\$134,541, as compared with exports for 1956 of 265,483 pounds, valued at US\$110,528.

The United States received 40,250 pounds (value US\$14,923) of whole spiny lobsters, 155,388 pounds (value US\$95,678) of spiny lobster tails, 25,151 pounds (US\$3,479) of fish (fresh, frozen, or live), 11,690 pounds (value US\$2,114) of conchs, 100 pounds of shrimp (value US\$50), and 514 pounds of shark skins (value US\$397). In 1956, exports to the United States consisted of 125,011 pounds (value US\$81,556) of spiny lobster tails, and 240 pounds (value US\$52) of whole spiny lobsters.

The quantity of fishery products shipped to the United States during 1957 amounted to 62.0 percent of the total poundage and 87.7 percent of the total value. In 1956 exports to the United States made up 47.2 percent of the volume and 81.0 percent of the value, according to an April 30, 1958, report from the American Consulate, Belize, British Honduras. Exports of spiny lobster tails to the United States in 1957 increased 24.3 percent over 1956 and were 94.5 percent above the 1955 exports.

FISHERIES TRENDS IN 1957: Although the total value of exports was up in 1957, prospects for the British Honduras fishing industry are not good. The most serious problem is that existing fisheries are being exhausted, nothing is being done to develop others, and fishing as a vocation is dying out as the old men fail to be replaced by the young who prefer a different life. Fishing here is still done almost exclusively by the centuries-old method of the one-, two- or three-man dugout canoe or sailboat operating with crude lobster pots, hand lines, and occasionally with small nets. It has been proposed that a fisheries school be operated and that a sufficient monopoly be granted to warrant the introduction of the capital required for modern fishery methods and equipment. However, two small companies have been granted concessions and both are finding it difficult to operate. The only forward-looking plan--and it is still just a plan--is to conduct a far-reaching survey of potentialities.

There is a small export of salted and dried fish to neighboring countries, but this is declining rapidly for a variety of reasons: (1) the lesser number of fishermen, (2) consumer tastes, and (3) protective import duties. The principal export is of frozen spiny lobster tails; frozen whole spiny lobsters are of lesser importance in value. The export of frozen fish almost doubled in 1957. But expectations of a considerable industry exporting fish--as distinct from spiny lobster--have not materialized. It appears that British Honduras simply cannot compete in the United States market.

Shrimp fishing is negligible to date. Apparently there are few shrimp to be had.



Canada

LIQUID MEASURE FOR SHUCKED OYSTERS PERMITTED: A January 31, 1958, directive of the Canadian Government requiring that all containers of imported shucked shellfish meats must be labeled with the net weight has been reconsidered. Due to protests from the seafood packers in the United States, Canadian labeling requirements have been amended to permit containers of shucked oysters shipped from the United States to be marked with the "Imperial Liquid Measure." It is still necessary to have the name and address of the packer on the container showing that the product came from the United States. The requirements promulgated by the January 31, 1958, directive are as follows:

- (1) Master cartons, shipping containers, barrels, etc. shall be correctly and legibly marked or labeled with the name and address of the packer or the license number of the packer.
- (2) The container must bear the name of the country of origin. The words "Product of --" are not essential. The country of origin must be evident from the name and address of the packer.
- (3) The wrapper or label of the package must bear the name and address of the packer or the license number of the packer. The label must bear the name of the country of origin.
- (4) Containers of shucked shellfish meat must be labeled in terms of net weight.

This change in the Canadian Government labeling regulations permitting the liquid-measure designation brings their requirements as to designation of weight into line with those of the U. S. Food and Drug Administration and other agencies in the United States that control weights and measures.



Denmark

FISH MEAL PRODUCTION UP 17 PERCENT IN 1957: During 1957 the available Danish supplies of fish meal totaled 66,000 metric tons, or practically the same quantity as during the preceding year. The domestic production increased from 47,000 tons in 1956 to 55,000 tons in 1957. This increase was, however, offset by a drop in imports of 8,000 tons.

The larger Danish output of fish meal was a result of increased catches of herring and launce or sand eel. Launce has been subject to intensive fishing during recent years as it has proved valuable in the production of fish meal and oil because it is found in rather ample quantities in the North Sea.

The exports of fish meal increased from 40,000 tons in 1956 to 42,000 tons in 1957, while the domestic consumption remained unchanged at 21,000 tons.

The major export outlets for Danish fish meal were the United Kingdom (22,700 tons) and Holland (14,200 tons). Compared to 1957, the exports to those two countries increased by 12,000 tons and declined by 5,800 tons, respectively. (United States Embassy, Copenhagen, dispatch dated May 14.)

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MARINE OIL PRODUCTION AND IMPORTS DECREASED IN 1957: During 1957 the available Danish supplies of marine oils (fish-liver oil, fish oil, whale and seal blubber oil, whale oil, and seal oil) totaled 37,334 metric tons, or approximately 2,200 tons less than in 1956 (see table 1). This was the net result of reduced imports and less domestic production.

Table 1 - Danish Supply and Distribution of Marine Oils, 1957 and 1956

Table 1 - Danish Supply and Distribution of Marine Oils, 1957 and 1956								
Type	Opening Stocks January 1	SUPPLY			DISTRIBUTION			
		Production	Imports	Total Supply	Exports	Consumption	Ending Stocks December 31	Total Distribution
(Metric Tons)								
1957:								
Fish-liver oil	n. a.	200	1,736	1,936	316	1,620	n.a.	1,936
Fish (incl. herring) oil	706	13,200	2,603	16,509	8,593	5,618	2,298	16,509
Whale and seal blubber oil	n.a.	1,000	-	1,000	-	1,000	n.a.	1,000
Whale oil	7,606	n.a.	10,263	17,869	105	10,017	7,747	17,869
Seal oil	n.a.	n.a.	20	20	14	6	n.a.	20
Total	8,312	14,400	14,822	37,334	9,028	18,261	10,045	37,334
1956:								
Fish-liver oil	n.a.	200	1,886	2,086	381	1,705	n.a.	2,086
Fish (incl. herring) oil	684	14,048	1,606	16,338	8,179	7,453	706	16,338
Whale and seal blubber oil	n.a.	900	-	900	-	900	n.a.	900
Whale oil	5,299	n.a.	14,298	19,597	68	11,923	7,606	19,597
Seal oil	n.a.	624	11	635	135	500	n.a.	635
Total	5,983	15,772	17,801	39,556	8,763	22,481	8,312	39,556

N.A. - NOT AVAILABLE.

The reduced imports were due primarily to smaller purchases of whale oil. The lower domestic production of marine oils was due to a smaller production of fish oil. This may seem a little unusual considering that production of fish meal increased notably. The explanation is, however, that certain types of fish used for reduction possess a lower oil content than those previously constituting the bulk of the industrial fish landings.

The principal marine oil imported during 1957 was whale oil, practically all (10,263 tons) of which came from Norway.

The exports of marine oils increased only a trifle during 1957 (9,028 tons) and were made up almost entirely of herring oil. The principal buyers were Sweden (5,263 tons), Norway (1,555 tons), and West Germany (1,484 tons).

The domestic consumption of marine oils declined by approximately 4,200 tons to 18,261 tons.

Total production of marine oils in 1957 amounted to 14,400 tons, of which 13,200 tons were fish oil (including herring oil). In 1956 the production was 15,772 tons, of which 14,048 tons were fish oil. All of the fish and whale oil in Denmark is used in edible products. (United States Embassy report from Copenhagen dated May 14, 1958.)

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FAROESE GOVERNMENT INVITED TO DISCUSS TERRITORIAL WATERS FISHING LIMITS: The Danish Government has sent an invitation to the local Faroese Government to discuss the problem of international territorial waters fishing limits. Børsen (financial) states that it is the Danish Government's intention to continue to work for an expansion of the fishing limits around the Faroe Islands. This is in keeping with the Government's declaration at the Geneva conference that populations which are to a high degree dependent on the sea because of their geographic position as, for example Iceland, the Faroes, and Greenland, should be able to fix their fishing limits up to 12 nautical miles.



Haiti

JAPANESE FISHERY COMPANY PLANS TO BASE TUNA FISHING OPERATIONS IN HAITI: The Haitian legislature has been asked to ratify a contract signed on April 30, 1958, by the Government of Haiti and a large Japanese fishery company. If the contract is ratified, the company will use Haiti as a base for deep-sea tuna fishing operations and establish a 600-ton freezing plant in Port-au-Prince.

The Japanese firm will probably establish a large fishing operation out of Haiti and will export tuna and possibly other fish to the United States. It is doubted that the firm will engage in any type of processing other than simple freezing, according to a United States Embassy dispatch from Port-au-Prince, dated May 26, 1958.

The firm has been exploring the Central and South Atlantic for fishery resources for some time, has located large quantities of tuna between Haiti and the Ascension Islands, and now has vessels operating in that area. The company has been looking for a base in the Caribbean from which to carry on Atlantic Ocean operations and Haiti seemed to offer satisfactory conditions for this.

The contract provides for the company to operate deep-sea fishing fleets out of any Haitian ports. Furthermore, the company will have exclusive rights for 25 years to export fish taken on the high seas by vessels based in Haiti. The firm has agreed to make fish available to the Haitian market, prior to offering it for export, and also has agreed to assist in every way in developing the coastal fishing within Haitian waters. Upon ratification of the contract, the firm will bring into Port-au-Prince Bay a freezing ship, which will receive and handle fish caught by the vessels now operating in the Atlantic.

Within four months after the ratification of the contract, the company expects to start building a 600-ton freezing plant, probably in Port-au-Prince. The firm also plans to bring in shipwrights and other necessary skilled personnel to start constructing coastal fishing vessels in Haiti for use by Haitian fishermen, as well as for its own use.

The company plans to concentrate its high-seas operations on tuna, using long-line gear on large vessels.

The contract provides that all vessels operated within coastal waters will use at least 40 percent Haitian crews the first year, increasing this to as high as 90 percent or more before the 25 years of the contract are completed.

Haiti will receive no tax on the fish exported out of Haiti, but will benefit by the development of her coastal vessels and by the supplying of fish to the Haitian market without the loss of foreign exchange. Haitian waters are not being fished at this time, and therefore any development which is brought about will be a net gain for Haiti; however, the contract as now written will eliminate any other firms from using Haitian ports for high-seas fisheries, unless they want to sell their entire catch into the Haitian market.

The contract calls for the company to observe all fishing ordinances and maritime regulations imposed by the Haitian Government, but since the company's chief interest is high-seas fisheries, the Haitian Government would have no control over these fisheries past the territorial waters limit.



Honduras

SHRIMP FISHERY AND FREEZING PLANT LOCATED ON ISLAND OF GUANAJA: During the early part of 1958, a United States shrimp fishing company moved to the

Island of Guanaja (Bonacca) with five shrimp vessels. The Guanaja Island is one of a group of islands (Islas de la Bahia) which lie about 10-40 miles off the north coast of Honduras. This island, easternmost of the main islands, is about nine miles long and five miles wide at its widest point.

A new freezing plant, when completed, will have a capacity of 100,000 pounds annually. The shrimp grounds are reported to be about 100 miles from the Island and are promising. Another United States company is reported to be seriously considering sending a fleet of boats to operate out of Guanaja, according to an April 7, 1958, dispatch from the United States Embassy in Tegucigalpa.



Iceland

DECREE CONCERNING EXTENSION OF TERRITORIAL WATERS FISHERY LIMITS: The text of a decree, scheduled to be released June 30, 1958, concerning the extension of Icelandic territorial waters fishery limits, was recently published by the Icelandic newspaper *Thjodviljinn*. The only material changes to existing Law No. 21 of March 19, 1952, are as follows:

1. The new fishery limits will be 12 miles from the baseline.
2. Icelandic vessels engaged in trawl, floating trawl, or drag-net fishing shall be permitted to fish within the new limits up to the present limit of four miles.
3. Special regulations regarding fishing areas and fishing periods shall be made and announced in detail.
4. The decree on fishing limits shall come into force on September 1, 1958.
5. The period from the time of release to the implementation of the decree on fishing limits shall be used to gain recognition for and understanding of the legality and necessity for extension of limits.
6. Iceland reserves the right to make adjustments to the baseline.

In addition to the decree, new fishery regulations were expected to be issued on June 30, 1958, according to the newspaper story. These regulations are to extend the conservation area to 12 nautical miles with no change in baselines and ban all operations of foreign vessels within that area. Icelandic trawlers would be permitted to operate in the outer 8 miles, subject to provisions that will be determined later.

* * * * *

POLISH TRADE AGREEMENT FOR 1958/59 INCLUDES FISHERY PRODUCTS:

A protocol, covering the exchange of commodities from March 1, 1958, to February 28, 1959, to the 1949 trade agreement between Iceland and Poland was signed on March 20, 1958. It includes exports of fishery products from Iceland to Poland. Shipments of fishery products from Iceland to Poland under the new agreement for 1958/59 were programmed at 7,900 metric tons as compared with 5,300 tons (only 5,223 tons valued at US\$1,032,000 were actually delivered) for the year ending February 28, 1958. Actual shipments

Table 1 - Icelandic Fishery Products Exports to Poland Programmed for 1958/59, 1957/58, and Actual Exports for 1957/58

Item	Programmed Shipments		Actual Shipments
	1958/59	1957/58	1957/58
	(Metric Tons)		
Herring, frozen	2,500	2,000	1,500
Herring, salted	2,000	1,000	1,000
Fish meal	2,000	1,500	1,500
Cod-liver oil (medicinal)	1,200	600	936
Other fish oils	200	200	287
Fish fillets, frozen	1/	-	-
Total	7,900	5,300	5,223

1/SHIPMENTS WILL BE MADE IF AVAILABLE.

may vary from the amount programmed when supplies fail to meet estimates as was the case for frozen herring in 1957. The agreement between Iceland and Poland may be automatically extended for another year unless one of the contracting parties declares it wishes to negotiate a new protocol. The exports of fishery products programmed for the year ending February 28, 1959, the programmed shipments for the previous year, and the actual shipments for this year are shown in table 1.



Israel

SHRIMP EXPORTS TO UNITED STATES: Shrimp exports from Israel to the United States in 1958 will reach 15 metric tons, according to an announcement by the Director of the Department of Fisheries in the Israel Ministry of Agriculture. The 1957 trial shipment of 10 tons of shrimp reportedly brought about US\$2,000 a ton.

During 1958 Israel will also export 15 tons of cuttlefish to Western Europe. Fresh fish were shipped in 1957 on a trial basis to Cyprus at prices not lower than those in Israel.

In anticipation of a further increase in the export of frozen fish, the Israel Fishermen's Union is expected to purchase a second freezing plant with a processing capacity of three tons of fish every 24 hours. The new plant will be acquired in the United States at a cost of IL28,000 (US\$50,400), of which the Israel Ministry of Agriculture will grant the Union a loan of IL15,000 (US\$27,000). The new fish-freezing plant is to be located at the Kishon Harbor. At present the only other freezer plant operating in Israel is situated at the Haifa port, with a capacity of only one ton per 24 hours.



Italy

TWO CANNERIES CUSTOM PACK ALBACORE TUNA: Two leading Italian canneries are custom packing canned albacore or white meat tuna for a large Italian firm, according to a letter received from Milan dated April 19, 1958. It is believed that most of this is imported Japanese albacore or fish landed at Italian ports directly by Japanese vessels.

This new venture is part of a plan the Italian firm has been putting into effect the past two years in order to engage in fishing and canning. The firm has a small fleet of tuna vessels operating in the Atlantic Ocean and bringing in tuna, mainly yellowfin, since this is the species most in demand on the Italian market.

All the fish is dressed and frozen on board the vessel.



Japan

CANNED FISH ACCOUNT FOR 60 PERCENT OF ALL CANNED PRODUCTS: Canned fishery products account for 60 percent of the total output of Japanese canneries. The principal canned fish are tuna, crab meat, salmon, sardines, and saury. Canned fish products of lesser importance are scallops, small clams, Hokki clams, and canned smoked oysters. These products from the Japanese fish canneries are sold all over the world (Foreign Agriculture, issued by the U. S. Department of Agriculture, April 1958).

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DISCOVERY OF PACIFIC ALBACORE TUNA SPAWNING GROUNDS: One of the great mysteries of nature has been the whereabouts of the Pacific spawning grounds of albacore--the choicest variety of tuna and a migratory surface-feeding type of fish found far from land.

Japanese fishery researchers now claim that the mystery has been solved. A fishing vessel operating along the equator somewhere west of the Gilbert Islands recently caught swordfish whose stomach contents included newly-spawned albacore. (*Pacific Islands Monthly*, April 1958.)

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EXPORTS OF SELECTED FISHERY PRODUCTS TO THE UNITED STATES, 1957: During 1957 exports of frozen tuna to the United States increased about 29.9 percent in quantity and 23.4 percent in value, as compared with 1956. Canned tuna exports in 1957 were down slightly in quantity and value from the previous year. Crab meat exports increased 22.0 percent in quantity and 22.1 percent in value. Other canned fishery products were up by 4.1 percent in quantity, but declined 3.3 percent in value in 1957 over the preceding year.

Japan's Exports of Selected Fishery Products to the United States, 1957				
Product	Quantity		Value	
	1957	1956	1957	1956
	(Metric Tons)		.. (US\$1,000) ..	
Tuna, frozen	51,629	39,754	15,098	12,235
Tuna, canned	12,870	12,893	11,538	11,619
Crab meat, canned . .	2,829	2,319	6,219	5,095
Other canned	16,370	15,729	13,524	13,981

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FISHERY LANDINGS IN 1957 AT RECORD HIGH: Japan's fisheries landings (excluding whales) and output of other marine products reached an all-time peak in 1957, according to the Japanese Ministry of Agriculture and Forestry. Japan's fisheries landings of 5,398,000 metric tons, which includes pelagic fishing, coastal and offshore fishing, shallow-water culture, and inland fishing and culture, was 13 percent higher than for 1956 and 10 percent higher than for the previous postwar peak attained in 1955.

The record 1957 output was attributed by the Ministry of Agriculture and Forestry to favorable migration of fish, improvements in fishing technique, and modernization of fishing equipment.

Domestic prices for fish in 1957 were about equal to those prevailing in 1956. The fishing industry therefore had a most successful year.

Whaling operations resulted in a catch of 16,018 whales (including sperm and baleen whales), an increase of 3,102 whales as compared with 1956 (the Antarctic whaling fleet was increased by one mothership operation in 1957), the United States Embassy in Tokyo reports.

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STATEMENT ON FISHING IN COASTAL WATERS OF U. S. S. R.: The position of the Japanese Government on the longstanding territorial issue with the Soviet Union was outlined in a statement by the Director of the Foreign Ministry's Public Information Bureau, March 24. Following is a translation of the statement as reported in *Japan Report* of April 20, 1958.

"On March 18, Soviet Deputy Foreign Minister N. T. Fedorenko delivered to Japanese Ambassador in Moscow, Suemitsu Kadowaki, the Soviet Government's reply to the Japanese request of February 28 concerning the question of fishing in coastal waters.

"In its reply, the Soviet Union repeated its past claim that it believed conditions were not yet suitable to discuss the question of fishing in coastal waters since the Japanese Government had not expressed readiness to conclude a peace treaty with the Soviet Union. At the same time, it stated that the territorial question had already been settled and that it could not consider any request of whatever nature from Japan.

"The Soviet claim that the territorial question was already settled has always been repeated by the Soviet Union ever since the Japanese-Soviet talks in London. However, it need not be pointed out at this stage that the territorial question between Japan and the Soviet Union is to be decided for the first time in a peace treaty.

"The disposition of Japanese territorial rights was stipulated for the first time in the San Francisco Peace Treaty. In this Treaty Japan relinquished its authority, title and right of demand to Southern Sakhalin and the Kurile Islands; but since the Soviet Union refused to sign the said Treaty, the territorial question between the two countries remains still unsettled.

"Talks for normalization of the Japanese-Soviet diplomatic relations, started in June 1955, failed to reach agreement on this question. Therefore, the two countries agreed to leave the question unsettled but restore diplomatic relations through the issuance of a joint Japanese-Soviet declaration. They decided to continue at a later date the negotiations on the conclusion of a peace treaty. The territorial question must thus

be included in the talks for the conclusion of a peace treaty, and Japan cannot agree to the Soviet Government's claim that the territorial question has already been settled.

"Japan is prepared to conclude a peace treaty at any time if the Soviet Union accepts Japan's just demand to hand over the two islands of Habomai and Shikotan, which are a part of Hokkaido, as well as the islands of Kunashiri and Etorofu, since both are the inherent territories of Japan.

"The Soviet Government in its latest reply has made clear its attitude that it regards the territorial question as having been settled and that it cannot agree with any indication that the Soviet Union is attempting unilaterally to force upon Japan its claim on the territorial question in connection with fishing in coastal waters. Needless to say, however, the return to Japan of its inherent territories is the united and fervent desire of the Japanese people, and this claim cannot be relinquished.

"Despite the opposing claims of both countries on the territorial question and the difficult position in which the conclusion of a peace treaty has been placed, Japan, in compliance with the spirit of the joint Japanese-Soviet declaration, has successively settled various pending problems between Japan and the Soviet Union and is pursuing a policy of furthering the friendly relations between the two countries. There will be no change in this policy in the future.

"Japan's request for talks on the question of fishing in coastal waters is based on this policy. Japan, therefore, renews its hope that the Soviet Union will also, from the standpoint of promoting friendly Japanese-Soviet ties, agree to talks on the question of fishing in coastal waters and, at the same time, strive for a satisfactory settlement of the problem."

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VALUE OF FISHERY PRODUCTS EXPORTS, 1957: Exports of fishery products by Japan in 1957 were valued at US\$122 million f. o. b. (exclusive of fish and marine mammal oils and aquatic products), according to figures compiled from customs data by the Japanese Ministry of Finance. Fishery products exports made up about 2.3 percent of the total value of US\$2,858 million for all exports.

The exports of fishery products in 1957 to the United States amounted to US\$55 million, or about 45.1 percent of the value for all fishery products. The United Kingdom was second in terms of value with a total of \$22 million and the Philippines was third with a value of US\$5 million. These three countries accounted for 67 percent of Japan's foreign trade in fishery products.

In addition to the above, Japan exported fish oils valued at US\$23 million, of which the United States share was US\$4 million. (United States Embassy report from Tokyo, dated April 24, 1958.)



Mexico

LONG-LINER LANDS TUNA TRIP AT GULF PORT: The single Mexican tuna long-liner fishing in the Gulf of Mexico out of Veracruz returned to port in May with 6.2 metric tons of yellowfin tuna after a five-day trip (4 days of fishing). This was a particularly successful voyage since an average of 20 tuna per 100 hooks was maintained.

The vessel, *La Jarocho*, is a converted purse seiner about 62 feet long equipped with a Japanese line-hauler, but with no refrigeration. The master fisherman is an experienced Japanese fisherman. The boat fishes 10 baskets of 30 hooks each. Upon capture the fish were gutted and iced-down in the hold. The fish were delivered to the Veracruz cannery that owns the vessel.

At present only tuna are landed, but officials of the recently-formed Marine Biological Station of the Veracruz Technological Institute have become interested in the project and expect to find a market for the many sharks that are caught. An attempt is also being made to develop a market in Mexico City for fresh yellowfin. It is claimed that beheaded and gutted yellowfin can be delivered to wholesalers in Mexico City at about 18 and 25 U. S. cents a pound, which would place it in the upper-middle-class price range for fresh fish, the United States Embassy in Mexico City reported in a May 21, 1958, dispatch.



Morocco

FISHING AND CANNING TRENDS, FIRST QUARTER 1958: Canned Sardines: The current fishing and canning season in Morocco has been among the best for several years, as fish supplies were plentiful and of fine quality. France purchased the whole of its import quota of Moroccan canned sardines free of duty to help keep local prices down. This official quota was 12,000 metric tons, or 600,000 cases of 100 cans each. As the French catch was short, France accepted an additional 60,000 tons at normal duty.

From June 1, 1957 (beginning of the fishing season) to December 31, 1957, the pack of canned sardines was estimated at 2 million cases. During the same period, 1.2 million cases were exported. Thus, a serious surplus has developed and markets for it are now being sought, principally through the use of trade agreements.

Fish: Morocco produces large quantities of fish, but consumes only 3.3 pounds of fish a year per capita, whereas the average consumption in Europe is 15 times as much. To promote increased local consumption of fresh fish, a national committee decided to start a campaign of price control, to organize fish packing, refrigeration, transportation, and sanitary control, as well as appropriate advertising. Also, to permit continued fresh fish exports to Algeria at competitive prices, Moroccan exporters obtained in February the suppression of the Algerian import quota.



New Hebrides

TUNA FREEZING PLANT IN OPERATION: The new tuna freezing plant (received its first fish in October 1957) located on the island of Espiritu Santo, New Hebrides, has a freezing capacity of 32 tons of tuna a day, storage space for 500 tons, a brine- and smoke-curing plant, an ice-making capacity of 20 tons daily, an ice storage space of 200 tons, and ample docking facilities. More storage space for an additional 200 tons is planned.

Two Japanese tuna fishing vessels have been landing their catches at the new plant. Landings from the first few trips have been very good and prospects are good for the future. Catches have been made up of 60 percent albacore tuna, 10 percent yellowfin tuna, and 30 percent marlin, sailfish, and other fish, the United States Consulate at Noumea, New Caledonia, reported on May 8, 1958.



Norway

COD FISHERIES TRENDS THROUGH MAY 3, 1958: During the week ending May 3, 1958, in Finnmark, Lofoten, weather conditions were mostly good and landings of young cod continued to increase. The total landings of young cod in 1958 through May 3 amounted to 38,582 metric tons as compared with 22,143 tons and 17,363 tons, respectively, for the corresponding periods in 1957 and 1956.

Total Norwegian landings of young cod and spawning cod amounted to 106,348 tons as of May 3, compared with 80,129 tons last year and 123,742 tons in 1956 for comparable periods. Of this year's landings, 60,113 tons were sold for drying, 29,440 tons for curing, and 16,795 tons for fresh purposes.

U.S.S.R. OFFERS TO INCREASE HERRING PURCHASES:

Although Icelandic herring makes up a relatively small proportion of Norway's total herring catch, it is of considerable economic importance, according to a May 19 dispatch from the United States Embassy in Oslo. It is fished off the coast of Iceland by Norwegian vessels which leave Norway at the end of June.

The Iceland herring, the most desirable of all herring species, is used entirely for human consumption, since it is too valuable to be processed into oil and meal. When the Norwegian fleet leaves for the Iceland fishing grounds, it takes with it the barrels and necessary salt and spices for preparation and packing of the herring on board. The catch of Iceland herring fluctuates widely from year to year. A normal catch for a season is about 200,000 barrels; however, the fishing boats will sometimes take about 250,000-270,000 barrels in the event of a particularly rich haul.

The United States and Sweden have traditionally been the principal purchasers of Iceland herring, and the amounts sold to these markets do not vary much from

year to year. The U.S.S.R. represents a new element in the market. Sweden usually contracts for the herring before the fleet leaves while United States purchases take place after the fleet returns. In the past, the Soviets have not purchased in advance and have, in a sense, been taking what is left after Swedish and United States purchases. The Russian share of Iceland herring has not been large, but after a rich haul, the Norwegians have always had the possibility of selling the surplus to the Russians.

The Russians have recently expressed a desire to increase their share of Iceland herring and have offered to make firm long-term contracts to purchase as much as 100,000 barrels annually. Due to this, the Norwegian fishing interests are faced with a quandary. If the season is a particularly good one there will be enough herring to satisfy the Russian contracts and the traditional markets in the United States and Sweden, but if Norway must first fill Russian contracts, not enough herring will be left (in the event of a disappointing season) to cover the traditional markets.

**Panama**

NEW FISH MEAL PLANT IN OPERATION: The largest shrimp fishing and processing firm in Panama has completed and is now operating a new fish meal plant on Taboga Island.

In 1956 the company initiated a building program designed to transfer eventually all operations from its present site on the Gulf of Panama in a suburban residential district of Panama City to the island of Taboga. The 12-hour, 18-foot tide of the Gulf of Panama and the limited space of its present location were the principal reasons for the move. The new site, on the southeast end of the island, has a deep-water cove which will permit around-the-clock unloading and servicing of its boats. Substantial leveling and fill work has been carried out in preparation of the site. The program provides for the construction of expanded facilities for handling and freezing shrimp, docking facilities for up to 12 shrimp boats at a time, a marine yard with accompanying shops and storehouses, a 206-foot drydock, a small fish cannery, and the fish meal plant.

The first stage of the building program was the fish meal plant. Construction of the modern plant with the accompanying floating dock was completed in April 1957, at a cost of about US\$300,000. Used plant equipment purchased in the United States was supplemented by new equipment acquired abroad or constructed at plant site. Management of the plant was placed under an experienced German technician. Additional personnel presently consists of an American machinist in charge of the Diesel equipment, an Argentine national as assistant manager, and seven laborers.

Establishment of the fish meal plant makes possible the use of scrap fish caught by the Company's shrimp fleet and previously discarded as waste. Fish caught the last day out are left on deck, but if the boat is to be out for more than a day the fish are stored in the hold. The boat stops at Taboga on its way in from sea. Unloading at the fish meal plant may be done at low tide when it would not be possible for the trawler to reach the Company's dock in Panama City to discharge its shrimp catch. The fish are unloaded onto a screw conveyor mounted on the floating dock and are pumped with water through a pipe to the plant. Water and waste products and an occasional pelican are separated from the washed fish as they come out on the conveyor. The fish are weighed as they pass along the belt conveyor and are separated as to size on entering one of three concrete holding bins. The difference in cooking time necessitates separate handling of the large and the small fish. The fish are lifted from the bins by bucket conveyor to the steam sealer. They are carried by screw conveyor

through the steam sealer, the primary and secondary cookers, and into the press. Liquids extracted by the press, which include the oil and some solid residue, are channeled into a bin. Solids pass by screw conveyor into the primary grinders and continue by screw conveyor to the dryers. Blow dryers were selected because the meal cannot overheat with this process. The dried meal passes through a second grinder before moving on by screw conveyor to the sacking chute. Facilities are provided to permit meal considered too moist for fine grinding and sacking to be rechanneled through the dryers. The pulverized dried meal is placed in 100-pound burlap bags lined with tar paper and is permitted to cool before the bag is closed. These bags, which cost 40 U.S. cents each, are practically waterproof.

Presently, the oil and press liquors are lost in the liquid waste dumped into the sea. Pilot tests have shown the most efficient operation of the plant to be 9 to 10 tons of raw fish per hour. The footscrew press installed with the original equipment has an efficient operating capacity of no more than three tons per hour. This footscrew press is to be replaced by new equipment ordered from Germany with a capacity comparable to that of the other plant equipment, which will also clarify liquids, remove solids, and refine oil.

The fish meal recovery is about 20 percent of the raw fish weight. Recovery of solids from the press liquids will raise the percentage by 2 or 3 points. Oil content of the scrap fish is about one barrel (53 gallons) per ton of fish. The meal runs about 61 percent protein content and sells at US\$6.50 to US\$7.00 a 100-pound bag. About half of the plant's production is exported and half consumed in Panama, primarily in hog feeding.

Production of the plant is still very restricted by the lack of fish. Presently, production is limited to the scrap fish caught in the shrimp nets. The Company pays the boat crew \$10 a ton for the fish. The shrimp boats are bringing in from 2 to 6 tons each but the limited space on the trawler does not warrant saving these fish except on the last day or two of the trip. In order to increase the plant's fish supply, the Company has purchased five landing barges for use in picking up the day's catch of scrap fish from the shrimp boats at sea. Plans are to provide the plant with its own purse seiner fleet. The costly nets, however, make trained captains essential in the operation of a purse seine and experienced personnel is not available in Panama. The establishment of the initial fleet of purse seiners, therefore, is dependent on the import of experienced captains.

There are some 50 varieties of scrap fish of no commercial value found in the Gulf of Panama. The modern plant has the capacity to handle 240 tons of raw fish on a 24-hour-day

basis. Present operations carry the fish from the bin to the meal sack within 15 minutes. Adequate space has been provided in the plant layout for additional holding bins for raw fish and storage room for the hot sacked meal. Any additional plant labor needed is available on the Island. Special

feeding programs now being encouraged for improvement of the national livestock industry should increase local consumption of fish meal, the United States Embassy in Panama reports in a March 25, 1958, dispatch.



Poland

FISHERY MOTHERSHIP LAUNCHED FOR U.S.S.R.: A fishery mothership built for the U. S. S. R. was launched in Poland on April 12, 1958, according to a Polish newspaper. It is reported to be the largest ship, in respect to dimensions, thus far built in Polish yards. The vessel will operate in the Arctic, and is reinforced against ice. It is described as being 157 meters (515 feet) long, 20 meters (65.6 feet) wide, and 9 meters (29.5 feet) in depth. Designed for handling the catches of 40 trawlers at sea and a crew of 263, it is equipped with five refrigeration compartments, a drying chamber, "enormous fuel tanks," and a helicopter.



Spain

BILBAO AREA FISHERIES TRENDS, MARCH 1957: Fishing: Bilbao area fish wholesalers reported that while average catches were made in January and February 1958 by the trawling fleet on the high seas, smaller vessels operating close to the coast obtained poor results, because of the bad weather.

Fishing in Dakar: To fill in the gap of forced unemployment due to poor fishing in the Cantabrian waters during the month of November to February, a sizable portion of the fishing fleet of the provinces of Viscaya and Guipuzcoa has been seeking new fishing areas in the past few years. Efforts have been concentrated in the Dakar waters (off French West Africa) and in the Mediterranean.

During the 1956 winter season, 8 fishing vessels from Bilbao area ports fished for tuna in the region off Cabo Blanco, just north of Dakar. Operating about 60 days from the middle of November until the middle of January, the vessels caught 623 metric tons of tuna which sold for US\$95,238.

Encouraged by the good results obtained in 1956, 20 fishing vessels participated in this fishery in 1957, in the neighborhood of Dakar. Approximately 1,600 tons of tuna were caught and sold (headless) to canning factories in Las Palmas and Arrecife in the Canary Islands for about 7.7 U.S. cents a pound (US\$154 a short ton). While satisfied with their season's earnings, most of the returning fishermen expressed some disappointment in that they did not obtain the excellent catches made by the French vessels in the same waters. They pointed out that they were handi-

capped by the lack of adequate equipment and supplies, such as refrigeration and freezing units, nylon nets, fish detectors--all standard equipment of the French vessels.

Cod Fishing: After months of study and discussion an agreement was signed on March 6, 1958, in San Sebastian among Spanish, French, and Portuguese cod interests. The agreement is described as an attempt to find amicable solutions to certain basic problems, such as mutual aid to injured and sick fishermen, assistance in lifesaving, collision rights, etc., which result from the close-quarter methods of fishing traditionally employed by the fishermen of the three countries off the banks of Newfoundland, Labrador, Spitzbergen, and in the Barents Sea.

Early in March the Spanish cod fleet headed for the fishing banks off Newfoundland where it fishes until the end of October. Of the 100 ships of various tonnage, the largest were trawlers of 1,300 tons. The fleet carried a combined crew of 3,500 men. Annually about 80,000 metric tons of cod are caught which are valued at approximately US\$19 million. A round trip to Newfoundland requires about 30 days.

As usual, two sore problems will beset the fishermen. One concerns the lack of hospital facilities to take immediate care of sick or injured seamen. The other problem arises from the scarcity of water either for drinking or cooking. There will be a strict rationing of water among the seamen who will be away from their base port of operations in the French island of St. Pierre de Miquelon for over 70 days at a time.

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VIGO FISHERIES TRENDS, JANUARY-MARCH 1958: Fishing: Despite bad weather during March 1958, fish landings at Vigo, Spain, rose to 9.3 million pounds, valued at US\$973,000. Leading species were dollarfsh or pomfret, *Brama raii* (3.4 million pounds), small hake (1.5 million pounds), and horse mackerel (1.3 million pounds). The landings represented an increase of 0.3 million pounds over the preceding month, but were below the March 1957 total by 1.4 million pounds.

Total landings for the first quarter of 1958 were 25.3 million pounds valued at US\$2,820,000. This was an increase of 363,492 pounds and US\$347,000 over the first quarter of 1957.

About 20 fishing boats (mostly "parejas") left for the fishing banks off Newfoundland during February and March. This was an increase of seven from this area due to the additions to the fleet, and the shift of some vessels from the southern tuna fishery.

The closed season on mollusks and crustaceans went into effect on April 1. It was reported that the shellfish season for January-March 1958 was poor and below the 1957 landings.

The sardine season began in March after a two-month closed season in the Northeast and Cantabrian regions. Fishing circles were optimistic that this year might see the end of the poor sardine catches which have plagued the in-

dustry since 1946. This optimism is based on the 1957 figures for sardine landings at the port of Vigo. Although official statistics put these landings at 16.2 million pounds, it is estimated that landings exceeded 22.0 million pounds.

The 1957 total catch of sardines was far from the 30,000-40,000 metric tons which were common in some past years. The same amount of effort applied to the sardine fishery in these good years, it is estimated, would have doubled or tripled the 1957 landings.

Fish Canning and Processing: Fish canners in the Vigo area bought 710,000 pounds of fresh fish in March bringing the total for the quarter to 1.1 million pounds, a drop of 209,000 pounds from the first quarter of 1957. Primary cause for the drop was the low catch in January when the industry could only purchase 7,100 pounds.

Fish bought for smoking and salting amounted to 192,817 pounds for January-March 1958, a drop from the 2.5 million pounds used for this purpose in the first quarter of 1957. This decline was due to increased shipments (3.5 million pounds) of fresh fish to interior markets where demand pushed up prices 10-15 percent over last year.

Supplies for Canning Industry: The supply of olive oil and tinsplate remains, as in the past, inadequate to

NOTE: VALUES CONVERTED TO U.S. EQUIVALENT AT RATE OF 1 PESETA EQUALS US\$0.0236.

meet anticipated demand. Prices for olive oil have gone up to about 46.2 U.S. cents per quart, and there is talk of it going higher. The only relief the industry sees in sight is the soybean oil which the United States has recently agreed to ship to Spain. It is rumored that the Director General of Abastecimientos y Transportes made a quick trip to the United States in an effort to expedite the shipment.

Tinsplate prospects for the year do not look bright. Of the 250,000 boxes needed by fish canners in Spain for a year's production, canners hope to get approximately half.

Imports of tinsplate this year will be largely from England, as it was in 1957. Some tinsplate will be imported from France under the Spanish-French accord of December 4, 1957.

Talk has died down of the new plant at Aviles installing cold rolling equipment for the production of tinsplate but optimistically there are hopes that Altos Hornos de Vizcaya will start producing tinsplate by the beginning of next year.

Tinsplate prices are declining and the English have promised a slight cut, but German firms, until now too high priced for Spanish canners, are talking of cuts up to 15 percent.



Taiwan

FROZEN TUNA SHIPPED TO UNITED STATES: In January 1958 the China Fisheries Corporation, a Taiwan Government Corporation, made a trial shipment of 28 metric tons of frozen tuna to Los Angeles.

The shipment was sold to a California firm at c.i.f. prices ranging from US\$310 for yellowfin to US\$330 for albacore, the former predominating.

China Fisheries Corporation operates 4 tuna long-liners and 21 otter trawlers, the latter procured from the United Nations Near East Relief Agency. The four long-liners were built in Taiwan and self-financed. The only International Corporation Administration aid financing received by the Company is NT\$4,820,000 (US\$237,000) under a refrigeration project, which is still under construction.

It is reported that the price obtained for this trial shipment at Formosa was about NT939 (US\$46) and NT412 (US\$20) under the local sales price for yellowfin and albacore, respectively.



U. S. S. R.

INTERNATIONAL COOPERATIVE HERRING RESEARCH IN THE NORWEGIAN SEA PLANNED: The leader of Soviet fishery research recently stated that Soviet science is, among other things, working toward the development of scientific cooperation with Norway, Denmark, and Iceland for the development of a joint research project on herring grounds in the Norwegian Sea. A Soviet research vessel, Professor Mesjatsjev, will take part in the joint hydrological research in the Norwegian Sea, according to the May 14, 1958, issue of the Norwegian periodical Fiskaren.

TWO NEW-TYPE FACTORYSHIPS LAUNCHED: Two large factoryships were recently launched at a shipyard in Leningrad. One of them, the *Krasnogwardjejetz*, is viewed as the prototype for a series of factoryships to be built and is an improved version of the factory-trawler *Pushkin*, which was the first of 25 large Soviet factory-trawlers built in Kiel, Germany. The new type of factoryship has a total length of 278 feet (246 feet between perpendiculars), a breadth of 46 feet, and a depth of 32 feet from the upper deck to the keel, and a tonnage of 3,712 tons. The vessel is already in operation according to the Norwegian periodical *Fiskaren*, May 14, 1958.



United Kingdom

19TH RUSSIAN TRAWLER LAUNCHED: The 19th of the 20 trawlers ordered by Russia from a British ship-building firm was launched in early April 1958. These fishing vessels are almost 190 feet in over-all length and have a loaded displacement of 1,300 metric tons. They are also especially constructed to meet Arctic weather conditions (*World Fishing*, May 1958).

NOTE: ALSO SEE *COMMERCIAL FISHERIES REVIEW*, MAY 1958, P. 70; FEBRUARY 1958, P. 75; DECEMBER 1957, P. 71.

TEMPERATURE OF FISH AT ALL STAGES OF DISTRIBUTION CHAIN STUDIED: The temperature of fish at all stages of the distribution chain, from unloading at the port to sale in the stores, was studied during the summers of 1956 and 1957 by scientists of the Humber Laboratory of the British Department of Scientific and Industrial Research. This was done partly as a result of requests from the fish trade itself in order to find out whether existing conditions needed improvement and, if so, how improvements could be brought about.

Altogether, nearly 30,000 temperatures of fresh fish were taken and a great deal of information collected of the treatment and temperature of fish at all stages in the distribution chain.

On The Market: Although the majority of the readings obtained of temperatures of fish at the time of unloading from distant-water vessels was in the region of the temperature of melting ice (32° F.), a significant proportion was above 34° F. In work previously carried out by the Department on commercial vessels, temperatures as high as 52° F. were recorded.

Since at 42° F. fish spoils roughly 2.5 times as rapidly as at 32° F., although these temperatures appear to be only slightly higher than that of melting ice, they could nevertheless with advantage be lower. Fish that has been stored for a week at 42° F. will be very stale, while if it is stored in ice at 32° F. it will still be quite fresh. Bad handling on the trawler can result in the landing of very poor or indifferent fish.

When this has been said, however, it must be admitted that temperatures on the trawler are much lower than anywhere else in the distribution chain.

As soon as the fish is unloaded into market containers and removed from the ice, it begins to warm up towards the temperature of the air. The speed with which it does this depends upon air temperature, where the fish is in the market container, whether it is in direct sunlight, and so on. It is hardly surprising that fish on the surface warms up rapidly--the highest temperature recorded on the market before filleting (61° F.) was probably obtained from a fish on the top of a container--but fish at the bottom warms up almost as rapidly.

Filleting: By the time the fish comes to be filleted it is already warm and in the case of the highest temperatures recorded the fish would have suffered the same

amount of deterioration as fish stored for 2.5 days in ice. Even the bulk of the readings indicate that the loss of "shelf life" may be somewhere in the region of 24 hours up to the time of filleting.

When the fish is filleted, there is a sharp rise in temperature for the bulk of the readings. The reason for this is that the temperature of the water in the filleting operation is considerably higher than that of the fish. The warmest fish, on the other hand, is cooled down.

Boxing and Icing: After the fish is iced down in boxes and put on rail it begins to cool down. It takes a considerable time to do this and in many cases it appears that not nearly enough ice is added even to cool the fish down, let alone to keep it cool. In the case of the warmest fish, the amount of ice added is only sufficient to bring the temperature down to 50° F. or so--a temperature at which fish is going bad roughly five times as fast as at 32° F. or, in other words, five hours at this temperature equals a day's storage at 32° F. in ice.

It is by no means easy to suggest any remedy. Nevertheless it is imperative that something should be done. Much of the fish comes from distant waters and its average age is perhaps 10 days at landing. If care is not taken, it can easily be very stale by the time it reaches the housewife 24 hours or so later.

Icing Market Containers: The first thing to do is to try to stop the fish from warming up when it is unloaded, but how is this to be done? Top-icing the market containers, as is done in Grimsby for North Sea fish in the summer, could be adopted, but would have much less effect on the fish in the tub-shaped Hull kit than it would in the flat Grimsby box, because the Grimsby box exposes a greater surface of fish to the ice. Also, top-icing would make it very difficult to look at the fish before and during the auction.

Perhaps the most realistic suggestion is that the merchant should make sure that fish is well iced as soon as possible after he has purchased it.

In this survey it was found that a significant proportion of fish could still be lying in market containers at 4 p.m., either on the market or in merchants' premises. By this means the highest temperatures would almost certainly be avoided, although more rapid spoilage due to the fish warming up would not be entirely prevented.

Cooling the Fillets: The rapid rise in temperature when the fish is filleted could to some extent be overcome by adding lumps of ice to the water in the filleting operation. It should be noted that such a procedure is most necessary in warm weather. A better alternative, however, would be to cool the fillets down in ice-cold water as soon as they are filleted and then to pack them down in plenty of ice.

Add Enough Ice: The present trade practice is to ice fillets down with a layer of ice on top of a 28-pound box and in a 70-pound box to put a layer of ice at the top and the bottom. Even if enough ice is added, and this is rarely the case, it takes many hours for the ice to cool down the fish at the center of the box. If the fillets started off their journey at the temperature of melting ice, however, and the box had a layer of ice at the top and bottom to stop heat warming them up again, there would be little fault to find with present practice.

In passing, it may be observed that the custom of packing fillets with ice at each end of the box is virtually useless. The bulk of the fish is quite uncooled by the ice in the course of a normal journey from port to store.

The same general considerations apply to fish sent away whole. Since whole fish are not processed, however, under commercial conditions they are almost always a few degrees colder than fillets prepared at the same time from similar fish. It is, nevertheless, just as important for whole fish to be iced adequately as it is for fillets.

What is Adequate Icing? Adequate icing is difficult to define closely, since the amount to be added will depend on air temperature, the temperature of the fish to be cooled, the conditions of transport, and so on. As a general guide, however, it may be said that 42 pounds of ice to 56 of fish would by no means be excessive in summer time.

If more ice is to be added, however, freight on the actual weight of fish transported will be increased, and thus must inevitably mean an increase in the cost of fish. Obviously there is need for discussion between the appropriate authorities in order to arrive at a reasonable and just solution to this problem since the existing conditions encourage the transport of fish with the minimum of ice. Much can still be done, however, by making sure that the fillets are as close to 32° F. at the time of pack-

ing as is reasonably possible, so that all the ice which is added is used to prevent heat leaking into the fish from outside and not to cool the fish down.

At the Inland Market: When fish arrives at the railway terminus from the port it has reached its lowest temperature and is about to start warming up again. It is common practice to unload the fish from the rail cars and allow it to stand until sale time some hours later. Under these conditions it does, of course, begin to warm up to air temperature, although if sufficient ice had been added at the port, which is rarely the case, this would not occur.

Even where there is no ice on fish reaching the inland wholesale market, it is unusual for more ice to be added at this stage.

Although it is true that if sufficient ice is added to fish at the port, there should still be sufficient at the inland market to last until it reaches the shop, there are occasions when, for various reasons, nearly all the ice has melted and it therefore should be one of the duties of the inland wholesale merchant to inspect the fish passing through his hands and to re-ice where necessary.

In the Stores: The fish retailer inherits neglect at any of the previous stages in the distribution chain, and it is therefore all the more essential for him to inspect fish as soon as it arrives in his store and add ice where necessary.

When he puts his fish on display he is spreading it out in a thin layer exposed to the warm air and it therefore warms up much more rapidly than at any other stage in the whole distribution chain. It is absolutely essential to keep the fish cool on display and the best way of doing this is to use ice. Refrigerated slabs are still not in general use and some of those which are in existence are little better than uncooled slabs. There is obviously scope for further improvements in design and operation of this type of equipment.

It is most important that fish retailers should have all their cooling equipment regularly inspected by a competent refrigeration engineer. (*Fish Trades Gazette*, April 26, 1958.)

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TWO NEW FACTORYSHIPS SIMILAR TO "FAIRTRY": The British firm in Leith, Scotland, that owns the fish factoryship *Fairtry*, will add two similar vessels to its fleet. The second ship is due to be delivered in December and the third six months later.

After preliminary trials in a converted vessel, the *Fairtry* was launched 3-1/2 years ago. Russia, also operates a fleet of factoryships (moulded largely upon the plans of the *Fairtry* and her predecessor).

The new vessels, being built by a shipyard in Renfrew, Scotland, will be slightly shorter in length than the *Fairtry*, namely 235 feet between perpendiculars, compared with 245 feet. They are more compactly designed with an absolute minimum of waste space. Moulded breadth will be 48 feet and moulded depth 25 feet.

The vessels will be powered by Diesel electric engines, the three main generators providing current for the double armature propulsion motors of 2,000 s.h.p. at 130 r.p.m.

The freezing equipment will be much the same as that on the *Fairtry*. Three machines will handle 30 tons of fillets in 24 hours, with storage at 10° F. in the fish holds.

The fish meal plant will be of the continuous-process type instead of the batch type on the *Fairtry* and it is hoped that it will have a work capacity of 10 tons a day.

Four filleting machines are being installed and five plate freezers. Both Loran and Decca will be installed for navigational purposes and, in spite of the rapid advances in electronics, which sometimes seem to outdate equipment before it can be utilized, the new vessels will certainly be equipped with the finest range of equipment possible.

Accommodations are being provided for 96 people, including a certain number of specialists, in addition to the normal ship and factory crews.

When the *Fairtry* was first commissioned and the prospect of voyages of 2 to 3 months duration was discussed, it was thought by some that difficulty would arise in finding crews to remain at sea for such long periods of time. The firm, however, with its background of whaling experience and voyages lasting up to six months or more, proved that these pessimists were wrong.

In general, the crews have shown that they like the ship and the accommodations, comfort, and facilities provided, and the firm has had the best of support from the fishing section of the Transport and General Workers Union in finding crews, and negotiating conditions and pay.

The manning of the two new vessels is not therefore considered to be any real problem. A number of competent skippers and officers have already shown interest in them and the firm, in addition, hopes to be able to promote some of their own staff who are already experienced in operating the *Fairtry*.

The engineering personnel is somewhat more of a problem because of the diverse and highly technical nature of the machinery. Special training to selected personnel is being given as far as possible. The problem is to get the ordinary merchant marine engineer to interest himself in a fishing vessel, and on the other hand, for engineers used to ordinary trawlers to adapt themselves to the different types of equipment and method of operation.

Speaking in general terms on the experience of the *Fairtry* as to the hopes entertained for the new vessels, a

spokesman of the firm said that for the first year of the Fairtry's operation, the fishing was particularly good, and very satisfactory financial results were secured. For the past year, the fishing was not as good as formerly, and the firm was naturally concerned about it.

Nevertheless, it had been shown that profitable results could be obtained, even on the capital investment made in the Fairtry and contemplated in the new vessels. This was basically because the factoryship could remain fishing for such a long period and make sure of getting a catch before returning to port. The Fairtry cost, fully equipped, about £700,000 (almost US\$2.0 million), and the cost of each new vessel with equipment would be approximately £950,000 (US\$2.7 million). To safeguard the position of storing and marketing the increased output that would be attendant on the enlarged fleet, the firm was already taking steps in Hull and Grimsby to get increased cold-storage accommodations. At Hull, a warehouse which will hold nearly 2,000 tons of refrigerated fish is now being completed, and another to hold 3,000 tons was being provided in the new Grimsby development area.

Questioned about stern trawling, the firm's spokesman stated that the firm's experience showed it was the only satisfactory method for their purpose. They normally fish down to 250 fathoms with perfect safety and on occasions go down to 300 fathoms. Special safety devices have been installed to prevent accident in the case of snagging.

In connection with trawls, the firm has recently been experimenting with a new type of design aimed at getting a wider vertical mouth. With it they have secured good catches because the headline has been held at more than

twice the normal height above the footrope. This is in fact, the most promising development of recent date and they are pleased with the prospects of further improvement.

Another point made was that it had definitely been profitable to use the large-size mesh. The firm began using the maximum size of mesh now required, even before the regulations came into effect, because they had proved it was advantageous to avoid catching the small fish which could escape and grow into bigger fish.

The smallest average size of fish caught was approximately 16 inches in length. With the improved equipment, these were filleted in the round without gutting. That was a great saving of labor and it meant that now, with the recent improvements effected in their type of fish meal plant, all of the fish waste remained after filleting was processed for fish meal.

The only exception is large cod which are gutted for the livers. The oil in the livers of the small fish was squeezed out before the offal was converted to meal. The residue of the larger livers that were treated was also brought back to earn a further premium from shore factories for additional extraction.

"Thus the position is now achieved," concluded the firm's spokesman, "that the whole of the fish caught could be and is processed without any waste at all. The main product brought back--the sea-fresh filleted cod--has now established itself in selected markets as a special product and is beginning to command a deserved premium because of its quality." (The Fishing News, a British fishery periodical, dated March 14.)

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WHITE FISH AUTHORITY ANNOUNCES FISH PUBLICITY CAMPAIGN FOR 1958/59: Details have been announced of the forthcoming fish publicity campaign of the White Fish Authority for 1958/59. Advertisements will appear in 78 newspapers, including the three London evening papers. This will mean a total circulation of about 9.8 million in the provinces, Scotland, Wales, and Northern Ireland, and readership will be approximately 24 million.

In view of the fact that the British Trawlers' Federation will be advertising on a reduced scale this year, the Authority has increased the frequency of its insertions.

New store display material will again be available for both retailers and friers as part of the merchandising campaign. In view of the great success of the full color posters which the Authority produced last year, an attractive new set has been prepared. The Authority will continue to supply the trade with the popular laminated plastic price and name tickets.

During the last year the Authority has been building up a new service to the retailer--a sales advisory bulletin. Two editions have now reached the trade and in general have been well received.

The vital importance of increasing the sale of fish to hospitals, schools, industrial and other catering organizations, has long been recognized by the Authority, and this year they are intensifying their drive to obtain recognition for fish as a first-class food in all institutional cooking.

A booklet on the subject of fish for industrial catering is now in preparation, and this will be distributed to all those in the catering industry.

The utility companies are also being regularly supplied with information about choosing, preparing, and cooking fish.

During 1958 it is hoped that the Authority will be able to produce at least one film for showing to bulk users of fish.

In addition to advertising for the greater use of fish in school meals, the Authority believes that it is essential to interest children and young people in fish.

Several booklets are in preparation. The first of these is designed to interest younger school children and will describe simply, and with many illustrations, the history of Fish-From the Sea to the Table.

A second and more detailed book is being prepared and will be a complete and authoritative manual for grammar school teachers and such of their pupils as are interested in all aspects of the fish industry.

Last year the Authority carried on a very successful and amusing series of cookery competitions for men, which resulted in valuable publicity in the editorial columns of the Press in a number of cities throughout the country.

A variation of these is planned for the coming year and the flow of editorial publicity by the means of syndicated articles and recipes is to be maintained.

The authority sums up its campaign this year by saying that they will continue to focus attention on both the fish retailer and fish frier. They feel that increased expenditure on the educational promotion of fish will gain serious and welcome attention, from which every section of the industry will benefit, and which will, in turn, increase the sales of fish. (Fish Trades Gazette, April 26, 1958.)





FEDERAL ACTIONS



Federal Communications Commission

RULES FOR USE OF RADIO-TELEPHONE ON FISHING VESSELS:

During 1955, 1956, and 1957, Federal Communications Commission (FCC) engineers working in close cooperation with the U. S. Coast Guard and the Federal Bureau of Investigation, identified several trawler captains who used profane and indecent language while communicating over their radiotelephone stations. The offense is considered to be exceedingly serious because many families of small boat captains listen to the radiotelephone bands at home. Passengers on sport fishing boats and yachts can usually hear such communications coming in over the radio receiver on board.

To date, five captains have been charged with uttering obscene, indecent, and profane language by means of radio communication, in violation of Sec. 1484, Title 18 U. S. Criminal Code, while on the high seas in the Gulf of Mexico, and others are pending. Four captains have pleaded guilty as charged and two have been sentenced to two years probation, with one paying a \$500 fine.

The FCC's next important phase of enforcement will have to do with proper operation on the air. Visiting and other superfluous communications must now be curtailed and eventually stopped on the working frequencies 2638, 2738, and 2830 kc. In order for one boat to call another boat on a working frequency a pre-arranged schedule must be made and evidence of the pre-arranged schedule must be shown over the air. The rest of the time any radio equipment is in operation, 2182 kc., the distress frequency, must be monitored. The use of radio for pleasure or personal diversion must be stopped.

The FCC Rules are as follow: (1) Keep Part 8 of the Rules handy--post your station license prominently. (2) Do not turn transmitter on without an operator license or permit. (3) License cannot be transferred. (4) Renew them before they expire. (5) Keep your receiver tuned to 2182 kc. for calls. (6) Keep a log. (7) Give your call sign clearly when you begin and end each transmission. (8) Stop conversation with another ship after five minutes. do not contact the same ship again in less than five minutes. (9) Say only what is necessary, and sign off--others are waiting. (10) Swearing and use of indecent language on the air is a criminal offense.



Federal Trade Commission

ANOTHER SEATTLE CANNED SALMON BROKER CHARGED WITH PAYMENTS OF ILLEGAL BROKERAGE:

Another Seattle, Wash., primary broker of canned salmon and other food products was charged on April 21, 1958, by the Federal Trade Commission with granting illegal brokerage to some of its customers.

The firm and its president, the complaint alleges (complaint 7099, Food Products), have favored certain buyers with substantial allowances in lieu of brokerage or price concessions reflecting brokerage. In some transactions the unlawful rebates are not charged back to the packer-principals in whole or in part but are absorbed from the firm's customary 5-percent brokerage fee, the complaint says. In other instances, the payments are shared by the firm's president and the field broker involved out of the 2-1/2 percent split each receives. (A field broker is one hired to handle transactions in marketing areas other than Seattle.)

According to the complaint, these typical means have been used to make these allowances to favored buyers: (1) selling at net prices less than the amount accounted for to the packer-principals; (2) granting price deductions, a part or all of which were not charged back to the packer-principals; and (3) taking reduced brokerage on sales involving price concessions.

These practices, the complaint concludes, violate Sec. 2(c) of the Robinson-Patman Amendment to the Clayton Act.

The parties were granted 30 days in which to file answer to the complaint.

**SEAFOOD PACKER CHARGED
WITH MAKING ILLEGAL BROKERAGE
PAYMENTS:**

A Chinook, Wash., packing company was charged on May 29, 1958, by the Federal Trade Commission with granting illegal brokerage to some of its customers.

According to a Commission complaint (7147, Seafood), the packing firm generally sells its pack of canned salmon through brokers who receive fees ranging from 2 to 5 percent for their services. The complaint alleges, however, that the company and its president and treasurer have made many sales to brokers purchasing for their own account for resale, and allowed them allowances or discounts in lieu of brokerage. This practice violates Section 2(c) of the amended Clayton Act, the complaint charges.

The parties were granted 30 days in which to file answer to the complaint. A hearing is scheduled for August 18 in Seattle, Wash., before a Commission hearing examiner.

**CONSENT ORDERS APPROVED PROHIBITING ILLEGAL BROKERAGE BY
SEATTLE CANNED SALMON PACKERS:**

The Federal Trade Commission on May 1, 1958, approved consent orders (6904, 6905, 6906, 6907, canned salmon) prohibiting three Seattle canned salmon packers and an affiliated group of five firms, and their officers, from making illegal brokerage payments to their customers.

The Commission adopted separate initial decisions by Hearing Examiner Abner E. Lipscomb containing consent orders agreed to by the respondents and the Commission's Bureau of Litigation.

The Commission's complaints of October 7, 1957, charged the packers with granting large grocery chains discounts or allowances in lieu of brokerage in violation of Sec. 2(c) of the Clayton Act, as amended by the Robinson-Patman Act.

The complaints cited these typical methods used to make these payments:

On direct sales not involving brokers they reduce the market price to the chains by the customary brokerage fee of 5 percent; when only one broker is used, either a primary or field broker, these favored customers are given a 2½-percent reduction and the price differential is taken out of the broker's commission.

The packers generally sell through both types of brokers, the complaints said. Primary brokers are the selling agents for the Seattle area while field brokers are those employed by the primaries to handle transactions elsewhere.

The orders forbid these practices in the future.

The agreements are for settlement purposes only and do not constitute admissions by the respondents that they have violated the law.

**Department of Health,
Education, and Welfare****FOOD AND DRUG ADMINISTRATION****REQUIREMENT ON LISTING
OF INGREDIENTS FOR CANNED
CLAMS, FISH ROE, AND SHRIMP
ON LABEL POSTPONED:**

The Food and Drug Administration has postponed for one year--to September 17, 1959--the effective date of its order requiring a list of ingredients on the labels of certain nonstandardized food products; includes canned clams, canned fish roe, and canned shrimp (dry and wet pack), among other foods. The agency's statement of policy terminating the exemption was amended so that the new date appears.

Among the reasons given by several of the organizations requesting the extension was the need for additional time to agree on standards of identity for certain of the affected commodities.

The postponement as published in the Federal Register of May 7 follows:

TITLE 21—FOOD AND DRUGS**Chapter I—Food and Drug Administration, Department of Health, Education, and Welfare****PART 3—STATEMENTS OF GENERAL POLICY OR INTERPRETATION****TERMINATION OF EXEMPTION FOR DESIGNATED FOODS FOR WHICH LABEL DECLARATION OF INGREDIENTS HAS NOT BEEN REQUIRED PENDING STANDARDIZATION; EXTENSION OF EFFECTIVE DATE**

On September 17, 1957, there was published in the FEDERAL REGISTER (22 F. R. 7393) an order terminating the exemption for certain designated foods for which label declaration of ingredients as prescribed by section 403 (1) (2) of the Federal Food, Drug, and Cosmetic Act

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, DECEMBER 1957, P. 79.

had not been required. The Commissioner of Food and Drugs has received requests from the National Cannery Association, Cannery League of California, Northwest Cannery and Freezers Association, California Olive Association, New York State Cannery and Freezers Association, and other members of the canning industry for an extension of the effective date of the above-cited order; and good reason therefor appearing, pursuant to authority vested in the Secretary of Health, Education, and Welfare by the Federal Food, Drug, and Cosmetic Act (sec. 701, 52 Stat. 1055; 21 U. S. C. 371) and delegated to the Commissioner of Food and Drugs (22 F. R. 1045): *It is ordered*, That the effective date of the above-referenced order be extended until September 17, 1959.

The statement of policy in which this order appeared (21 CFR 3.1 (22 F. R. 7393)) is amended by changing the introduction to the section to read as follows:

§ 3.1 *Termination of exemption for designated foods for which label declaration of ingredients has not been required pending standardization.* Effective September 17, 1959, the exemption from the label declaration of ingredients requirements of section 403 (1) (2) of the Federal Food, Drug, and Cosmetic Act is terminated for the following foods:

(Sec. 701, 52 Stat. 1055; 21 U. S. C. 371)

Dated: May 1, 1958.

[SEAL] GEO. P. LARRICK,
Commissioner of Food and Drugs.

* * * * *

USE OF CHEMICAL SANITIZING AGENTS IN FOOD-MANUFACTURING PLANTS:

The Food and Drug Administration has issued a revised statement of policy with regard to the use of chemical sanitizing agents in food manufacturing establishments. The statement of policy is a substitute for one issued last year

which has led to confusion about the Food and Drug Administration's views on the use of quarternary ammonium sanitizing agents.

Following is the text of the new statement of policy as published in the Federal Register of May 30:

TITLE 21—FOOD AND DRUGS**Chapter I—Food and Drug Administration, Department of Health, Education, and Welfare****Subchapter A—General****PART 3—STATEMENTS OF GENERAL POLICY OR INTERPRETATION****USE OF CHEMICAL SANITIZING AGENTS IN FOOD-MANUFACTURING ESTABLISHMENTS**

Section 3.203 *Quarternary ammonium compounds in foods*, which was published in the FEDERAL REGISTER on November 30, 1957 (22 F. R. 9544) has led to confusion about the Food and Drug Administration's views on the use of quarternary ammonium sanitizing agents. This confusion requires the substitution

of the following statement of policy for the earlier one.

Now, therefore, under the authority vested in the Secretary of Health, Education, and Welfare by the Federal Food, Drug, and Cosmetic Act (sec. 701 (a), 52 Stat. 1055 as amended; 21 U. S. C. 371) and delegated to the Commissioner of Food and Drugs by the Secretary (22 F. R. 1045), and pursuant to the provisions of the Administrative Procedure Act (sec. 3, 60 Stat. 237, 238; 5 U. S. C. 1002), § 3.203 is changed to read as follows:

§ 3.203 *Use of chemical sanitizing agents in food-manufacturing establishments.* (a) The Administration recognizes the need for sanitizing procedures in food-manufacturing plants; it recog-

nizes that chemical sanitizing agents aid in the maintenance of plant cleanliness; and it recognizes that a number of sanitizing agents that are poisonous or deleterious may properly be employed so that they are effective and do not leave residues in food.

(b) The Food and Drug Administration does not object to the use of effective chemical sanitizing agents on food handling equipment in establishments subject to its jurisdiction provided precautions are taken to prevent adulteration of food that comes in contact with the treated equipment.

(Sec. 402, 52 Stat. 1046; 21 U. S. C. 342)
(Sec. 701, 52 Stat. 1055; 21 U. S. C. 371)

Dated: May 23, 1958.

[SEAL] GEO. P. LARRICK,
Commissioner of Food and Drugs.

**Department of the Interior****FISH AND WILDLIFE SERVICE****PROPOSED REGULATIONS FOR INSPECTION AND CERTIFICATION OF PROCESSED FISHERY PRODUCTS BY INTERIOR INSTEAD OF AGRICULTURE DEPARTMENT:**

Since the Department of the Interior is scheduled to assume, under the authority of the Fish and Wildlife Act of 1956, the responsibility for furnishing inspection and grading services to the fishing industry now performed by the Department of Agriculture, the Federal Register of May 30 carried a notice of the regulations proposed to be issued by

the Commissioner of Fish and Wildlife to govern the inspection and certification of processed fishery products, processed products thereof, and certain other processed food products. No substantive changes in the requirements imposed by the regulations have been made. Only the changes are proposed which are nec-

essary to codify the regulations under Title 50 with a substitution of the Department of the Interior for the Department of Agriculture as administering agency.

The notice and the proposed regulations as published in the May 30 Federal Register follow:

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

[50 CFR Part 170]

INSPECTION AND CERTIFICATION

NOTICE OF PROPOSED RULE MAKING

All functions of the Department of Agriculture which pertain to fish, shellfish and any products thereof, performed under the authority of title II of the act of August 14, 1946, popularly known as the Agricultural Marketing Act of 1946, as amended (7 U. S. C. 1621-1627), including but not limited to the development and promulgation of grade standards, the inspection and certification, and improvement of transportation facilities and rates for fish and shellfish and any products thereof, were transferred to the Department of the Interior by the Director of the Budget (23 F. R. 2304) pursuant to section 6 (a) of the act of August 8, 1956, popularly known as the Fish and Wildlife Act of 1956 (16 U. S. C. sec. 742e).

In furtherance of the transferred functions it is now incumbent on the Department of the Interior to prescribe regulations to govern the inspection and certification of Processed Fishery Products, Processed Products Thereof, and Certain Other Processed Food Products.

Notice is hereby given that pursuant to section 4 (a) of the Administrative Procedure Act of June 11, 1946 (60 Stat. 237), the Commissioner of Fish and Wildlife proposes to recommend to the Secretary of the Interior the adoption of regulations in the form tentatively set forth below entitled Part 170—Inspection and Certification. The proposed regulations, to become effective on or about July 1, 1958, are to be issued under the authority of the Agricultural Marketing Act of August 14, 1946, as amended (7 U. S. C. 1621-1627) and represent an adaptation of regulations appearing as 7 CFR Part 52 to fit the needs of a fishery products standards program. No substantive changes in the requirements imposed by the regulations are being made. Only the changes are proposed which are necessary to codify the regulations under Title 50 with a substitution of the Department of the Interior for the Department of Agriculture as the administering agency.

Prior to the final adoption of the proposed regulations, consideration will be given to any data, views or arguments relating thereto which are submitted in writing to the Commissioner, U. S. Fish and Wildlife Service, Washington 25, D. C., in time to reach the office not later than June 16, 1958.

Dated: May 28, 1958.

D. H. JANZEN,
Acting Commissioner
of Fish and Wildlife.

PART 170—INSPECTION AND CERTIFICATION

Sec. 170.1 Administration of regulations.

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§ 170.1 Administration of regulations. The Secretary of the Interior is charged with the administration of the regulations in this part except that he may delegate any or all of such functions to any officer or employee of the Bureau of Commercial Fisheries of the Department in his discretion.

DEFINITIONS

§ 170.6 Terms defined. Words in the regulations in this part in the singular form shall be deemed to import the plural and vice versa, as the case may demand. For the purposes of the regulations in this part, unless the context otherwise requires, the following terms shall have the following meanings:

Acceptance number. "Acceptance number" means the number in a sam-

¹ All functions of the Department of Agriculture which pertain to fish, shellfish and any products thereof, now performed under the authority of title II of the act of August 14, 1946, popularly known as the Agricultural Marketing Act of 1946, as amended (7 U. S. C. 1621-1627), including but not limited to the development and promulgation of grade standards, the inspection and certification, and improvement of transportation facilities and rates for fish and shellfish and any products thereof, were transferred to the Department of the Interior by the Director of the Budget (23 F. R. 2304) pursuant to section 6 (a) of the act of August 8, 1956, popularly known as the Fish and Wildlife Act of 1956 (16 U. S. C. sec. 742e).

pling plan that indicates the maximum number of deviants permitted in a sample of a lot that meets a specific requirement.

Act. "Act" means the applicable provisions of the Agricultural Marketing Act of 1946 (60 Stat. 1087 et seq., as amended; 7 U. S. C. 1621 et seq.).

Applicant. "Applicant" means any interested party who requests inspection service under the regulations in this part.

Case. "Case" means the number of containers (cased or uncased) which, by the particular industry are ordinarily packed in a shipping container.

Certificate of loading. "Certificate of loading" means a statement, either written or printed, issued pursuant to the regulations in this part, relative to check-loading of a processed product subsequent to inspection thereof.

Certificate of sampling. "Certificate of sampling" means a statement, either written or printed issued pursuant to the regulations in this part, identifying officially drawn samples and may include a description of condition of containers and the condition under which the processed product is stored.

Class. "Class" means a grade or rank of quality.

Condition. "Condition" means the degree of soundness of the product which may affect its merchantability and includes, but is not limited to those factors which are subject to change as a result of age, improper preparation and processing, improper packaging, improper storage or improper handling.

Department. "Department" means the United States Department of the Interior.

Deviant. "Deviant" means a sample unit affected by one or more deviations or a sample unit that varies in a specifically defined manner from the requirements of a standard, specification, or other inspection document.

Deviation. "Deviation" means any specifically defined variation from a particular requirement.

Director. "Director" means the Director of the Bureau of Commercial Fisheries.

Inspection certificate. "Inspection certificate" means a statement, either written or printed, issued pursuant to the regulations in this part, setting forth in addition to appropriate descriptive information relative to a processed product, and the container thereof, the quality and condition, or any part thereof, of the product and may include a description of the conditions under which the product is stored.

Inspection service. "Inspection service" means:

(a) The sampling pursuant to the regulations in this part;

(b) The determination pursuant to the regulations in this part of:

(1) Essential characteristics such as style, type, size, sirup density or identity of any processed product which differentiates between major groups of the same kind;

(2) The class, quality and condition of any processed product, including the condition of the container thereof by the examination of appropriate samples;

(c) The issuance of any certificate of sampling, inspection certificates, or certificates of loading of a processed product,

or any report relative to any of the foregoing; or

(d) Performance by an inspector of any related services such as assigning an inspector in a processing plant to observe the preparation of the product from its raw state through each step in the entire process, or observe conditions under which the product is being prepared, processed, and packed, or observe plant sanitation as a prerequisite to the inspection of the processed product, either on a continuous or periodic basis, or checkload the inspected processed product in connection with the marketing of the processed product.

Inspector. "Inspector" means any employee of the Department authorized by the Secretary or any other person licensed by the Secretary to investigate, sample, inspect, and certify in accordance with the regulations in this part to any interested party the class, quality and condition of processed products covered in this part and to perform related duties in connection with the inspection service.

Interested party. "Interested party" means any person who has a financial interest in the commodity involved.

Licensed sampler. "Licensed sampler" means any person who is authorized by the Secretary to draw samples of processed products for inspection service, to inspect for identification and condition of containers in a lot, and may, when authorized by the Secretary, perform related services under the act and the regulations in this part.

Lot. "Lot" has the following meanings:

(a) For the purpose of charging fees and issuing certificates, "Lot" means any number of containers of the same size and type which contain a processed product of the same type and style located in the same or adjacent warehouses and which are available for inspection at any one time: *Provided*, That:

(1) Processed products in separate piles which differ from each other as to grade or other factors may be deemed to be separate lots;

(2) Containers in a pile bearing an identification mark different from other containers of such processed product in that pile, if determined to be of lower grade or deficient in other factors, may be deemed to be a separate lot; and

(3) If the applicant requests more than one inspection certificate covering different portions of such processed product, the quantity of the product covered by each certificate shall be deemed to be a separate lot.

(b) For the purpose of sampling and determining the grade or compliance with a specification, "Lot" means each pile of containers of the same size and type containing a processed product of the same type and style which is separated from other piles in the same warehouse, but containers in the same pile bearing an identification mark different from other containers in that pile may be deemed to be a separate lot.

Officially drawn sample. "Officially drawn sample" means any sample that has been selected from a particular lot by an inspector, licensed sampler, or by any other person authorized by the Secretary pursuant to the regulations in this part.

Person. "Person" means any individual, partnership, association, business trust, corporation, any organized group of persons (whether incorporated or not), the United States (including, but not limited to, any corporate agencies thereof), any State, county, or municipal government, any common carrier, and any authorized agent of any of the foregoing.

Plant. "Plant" means the premises, buildings, structures, and equipment (including, but not being limited to, machines, utensils, and fixtures) employed or used with respect to the manufacture or production of processed products.

Processed product. "Processed product" means any fishery product or other food product covered under the regulations in this part which has been preserved by any recognized commercial process, including, but not limited to, canning, freezing, dehydrating, drying, the addition of chemical substances, or by fermentation.

Quality. "Quality" means the inherent properties of any processed product which determine the relative degree of excellence of such product, and includes the effects of preparation and processing, and may or may not include the effects of packing media, or added ingredients.

Rejection number. "Rejection number" means the number in a sampling plan that indicates the minimum number of deviants in a sample that will cause a lot to fail a specific requirement.

Sample. "Sample" means any number of sample units to be used for inspection.

Sample unit. "Sample unit" means a container and/or its entire contents, a portion of the contents of a container or other unit of commodity, or a composite mixture of a product to be used for inspection.

Sampling. "Sampling" means the act of selecting samples of processed products for the purpose of inspection under the regulations in this part.

Secretary. "Secretary" means the Secretary of the Department or any other officer or employee of the Department authorized to exercise the powers and to perform the duties of the Secretary in respect to the matters covered by the regulations in this part.

Shipping container. "Shipping container" means an individual container designed for shipping a number of packages or cans ordinarily packed in a container for shipping or designed for packing unpackaged processed products for shipping.

Unofficially drawn sample. "Unofficially drawn sample" means any sample that has been selected by any person other than an inspector or licensed sampler, or by any other person not authorized by the Director pursuant to the regulations in this part.

§ 170.7 Designation of official certificates, memoranda, marks, other identifications, and devices for purposes of the Agricultural Marketing Act, Subsection 203 (h) of the Agricultural Marketing Act of 1946 provides criminal penalties for various specified offenses relating to official certificates, memoranda, marks or other identifications, and devices for making such marks or identifications, issued or authorized under section 203 of said act, and certain misrepresenta-

tions concerning the inspection or grading of agricultural products under said section. For the purposes of said subsection and the provisions in this part, the terms listed below shall have the respective meanings specified:

Official certificate. "Official certificate" means any form of certification, either written or printed, including those defined in § 170.6, used under this part to certify with respect to the inspection, class, grade, quality, size, quantity, or condition of products (including the compliance of products with applicable specifications).

Official device. "Official device" means a stamping appliance, branding device, stencil, printed label, or any other mechanically or manually operated tool that is approved by the Director for the purpose of applying any official mark or other identification to any product or the packaging material thereof.

Official identification. "Official identification" means any United States (U. S.) standard designation of class, grade, quality, size, quantity, or condition specified in this part or any symbol, stamp, label, or seal indicating that the product has been graded or inspected and/or indicating the class, grade, quality, size, quantity, or condition of the product approved by the Director and authorized to be affixed to any product, or affixed to or printed on the packaging material of any product.

Official mark. "Official mark" means the grade mark, inspection mark, combined form of inspection and grade mark, and any other mark, or any variations in such marks, including those prescribed in § 170.88 approved by the Secretary and authorized to be affixed to any product, or affixed to or printed on the packaging material of any product, stating that the product was graded or inspected or both, or indicating the appropriate U. S. Grade or condition of the product, or for the purpose of maintaining the identity of products graded or inspected or both under this part.

Official memorandum. "Official memorandum" means any initial record of findings made by an authorized person in the process of grading, inspecting, or sampling pursuant to this part, any processing or plant-operation report made by an authorized person in connection with grading, inspecting, or sampling under this part, and any report made by an authorized person of services performed pursuant to this part.

INSPECTION SERVICE

§ 170.12 *Where inspection service is offered.* Inspection service may be furnished wherever any inspector or licensed sampler is available and the facilities and conditions are satisfactory for the conduct of such service.

§ 170.13 *Who may obtain inspection service.* An application for inspection service may be made by any interested party, including, but not limited to, the United States and any instrumentality or agency thereof, any State, county, municipality, or common carrier, and any authorized agent in behalf of the foregoing.

§ 170.14 *How to make application.* An application for inspection service may

be made to the office of inspection or to any inspector, at or nearest the place where the service is desired. An up-to-date list of the Inspection Field Offices of the Department may be obtained upon request to the Director. Satisfactory proof that the applicant is an interested party shall be furnished.

§ 170.15 *Information required in connection with application.* Application for inspection service shall be made in the English language and may be made orally (in person or by telephone), in writing, or by telegraph. If an application for inspection service is made orally, such application shall be confirmed promptly in writing. In connection with each application for inspection service, there shall be furnished such information as may be necessary to perform an inspection on the processed product for which application for inspection is made, including but not limited to, the name of the product, name and address of the packer or plant where such product was packed, the location of the product, its lot or car number, codes or other identification marks, the number of containers, the type and size of the containers, the interest of the applicant in the product, whether the lot has been inspected previously to the application by any Federal agency and the purpose for which inspection is desired.

§ 170.16 *Filing of application.* An application for inspection service shall be regarded as filed only when made in accordance with the regulations in this part.

§ 170.17 *Record of filing time.* A record showing the date and hour when each application for inspection or for an appeal inspection, is received shall be maintained.

§ 170.18 *When application may be rejected.* An application for inspection service may be rejected by the Secretary (a) for non-compliance by the applicant with the regulations in this part, (b) for non-payment for previous inspection services rendered, (c) when the product is not properly identifiable by code or other marks, or (d) when it appears that to perform the inspection service would not be to the best interests of the Government. Such applicant shall be promptly notified of the reason for such rejection.

§ 170.19 *When application may be withdrawn.* An application for inspection service may be withdrawn by the applicant at any time before the inspection is performed: *Provided*, That, the applicant shall pay at the hourly rate prescribed in § 170.76 for the time incurred by the inspector in connection with such application, any travel expenses, telephone, telegraph or other expenses which have been incurred by the inspection service in connection with such application.

§ 170.20 *Disposition of inspected sample.* Any sample of a processed product that has been used for inspection may be returned to the applicant, at his request and expense; otherwise it shall be destroyed, or disposed of to a charitable institution.

§ 170.21 *Basis of inspection and grade or compliance determination.* (a) In-

spection service shall be performed on the basis of the appropriate United States standards for grades of processed products, Federal, Military, Veterans Administration or other government agency specifications, written contract specification, or any written specification or instruction which is approved by the Secretary.

(b) Unless otherwise approved by the Director compliance with such grade standards, specifications, or instructions shall be determined by evaluating the product, or sample, in accordance with the requirements of such standards, specifications, or instructions: *Provided*, That when inspection for quality is based on any United States grade standard which contains a scoring system the grade to be assigned to a lot is the grade indicated by the average of the total scores of the sample units: *Provided further*, That:

(1) Such sample complies with the applicable standards of quality promulgated under the Federal Food, Drug, and Cosmetic Act;

(2) Such sample complies with the product description;

(3) Such sample meets the indicated grade with respect to factors of quality which are not rated by score points; and

(4) With respect to those factors of quality which are rated by score points, each of the following requirements is met:

(i) None of the sample units falls more than one grade below the indicated grade because of any quality factor to which a limiting rule applies;

(ii) None of the sample units falls more than 4 score points below the minimum total score for the indicated grade; and

(iii) The number of sample units classed as deviants does not exceed the applicable acceptance number indicated in the sampling plans contained in § 170.61. A "deviant," as used in this paragraph, means a sample unit that falls into the next grade below the indicated grade but does not score more than 4 points below the minimum total score for the indicated grade.

(5) If any of the provisions contained in subparagraphs (3) and (4) of this paragraph are not met the grade is determined by considering such provisions in connection with successively lower grades until the grade of the lot, if assignable, is established.

§ 170.22 *Order of inspection service.* Inspection service shall be performed, insofar as practicable, in the order in which applications therefor are made except that precedence may be given to any such applications which are made by the United States (including, but not being limited to, any instrumentality or agency thereof) and to any application for an appeal inspection.

§ 170.23 *Postponing inspection service.* If the inspector determines that it is not possible to accurately ascertain the quality or condition of a processed product immediately after processing because the product has not reached equilibrium in color, sirup density, or drained weight, or for any other substantial reason, he may postpone inspection service for such period as may be necessary.

§ 170.24 *Financial interest of inspector.* No inspector shall inspect any processed product in which he is directly or indirectly financially interested.

§ 170.25 *Forms of certificates.* Inspection certificates, certificates of sampling or loading, and other memoranda concerning inspection service shall be issued on forms approved by the Secretary.

§ 170.26 *Issuance of certificates.* (a) An inspection certificate may be issued only by an inspector: *Provided*, That, another employee of the inspection service may sign any such certificate covering any processed product inspected by an inspector when given power of attorney by such inspector and authorized by the Secretary, to affix the inspector's signature to an inspection certificate which has been prepared in accordance with the facts set forth in the notes, made by the inspector, in connection with the inspection.

(b) A certificate of loading shall be issued and signed by the inspector or licensed sampler authorized to check the loading of a specific lot of processed products: *Provided*, That, another employee of the inspection service may sign such certificate of loading covering any processed product checkloaded by an inspector or licensed sampler when given power of attorney by such inspector or licensed sampler and authorized by the Secretary to affix the inspector's or licensed sampler's signature to a certificate of loading which has been prepared in accordance with the facts set forth in the notes made by the inspector or licensed sampler in connection with the checkloading of a specific lot of processed products.

§ 170.27 *Issuance of corrected certificates.* A corrected inspection certificate may be issued by the inspector who issued the original certificate after distribution of a certificate if errors, such as incorrect dates, code marks, grade statements, lot or car numbers, container sizes, net or drained weights, quantities, or errors in any other pertinent information require the issuance of a corrected certificate. Whenever a corrected certificate is issued, such certificate shall supersede the inspection certificate which was issued in error and the superseded certificate shall become null and void after the issuance of the corrected certificate.

§ 170.28 *Issuance of an inspection report in lieu of an inspection certificate.* A letter report in lieu of an inspection certificate may be issued by an inspector when such action appears to be more suitable than an inspection certificate: *Provided*, That, the issuance of such report is approved by the Secretary.

§ 170.29 *Disposition of inspection certificates.* The original of any inspection certificate, issued under the regulations in this part, and not to exceed four copies thereof, if requested prior to issuance, shall be delivered or mailed promptly to the applicant, or person designated by the applicant. All other copies shall be filed in such manner as the Secretary may designate. Additional copies of any such certificates may be supplied to any interested party as provided in § 170.78.

§ 170.30 *Report of inspection results prior to issuance of formal report.* Upon request of any interested party, the results of an inspection may be telegraphed or telephoned to him, or to any other person designated by him, at his expense.

APPEAL INSPECTION

§ 170.36 *When appeal inspection may be requested.* An application for an appeal inspection may be made by any interested party who is dissatisfied with the results of an inspection as stated in an inspection certificate, if the lot of processed products can be positively identified by the inspection service as the lot from which officially drawn samples were previously inspected. Such application shall be made within thirty (30) days following the day on which the previous inspection was performed, except upon approval by the Secretary the time within which an application for appeal inspection may be made may be extended.

§ 170.37 *Where to file for an appeal inspection and information required.* (a) Application for an appeal inspection may be filed with:

(1) The inspector who issued the inspection certificate on which the appeal covering the processed product is requested; or

(2) The inspector in charge of the office of inspection at or nearest the place where the processed product is located.

(b) The application for appeal inspection shall state the location of the lot of processed products and the reasons for the appeal; and date and serial number of the certificate covering inspection of the processed product on which the appeal is requested, and such application may be accompanied by a copy of the previous inspection certificate and any other information that may facilitate inspection. Such application may be made orally (in person or by telephone), in writing, or by telegraph. If made orally, written confirmation shall be made promptly.

§ 170.38 *When an application for an appeal inspection may be withdrawn.* An application for appeal inspection may be withdrawn by the applicant at any time before the appeal inspection is performed: *Provided*, That, the applicant shall pay at the hourly rate prescribed in § 170.76, for the time incurred by the inspector in connection with such application, any travel expenses, telephone, telegraph, or other expenses which have been incurred by the inspection service in connection with such application.

§ 170.39 *When appeal inspection may be refused.* An application for an appeal inspection may be refused if:

(a) The reasons for the appeal inspection are frivolous or not substantial;

(b) The quality or condition of the processed product has undergone a material change since the inspection covering the processed product on which the appeal inspection is requested;

(c) The lot in question is not, or cannot be made accessible for the selection of officially drawn samples;

(d) The lot relative to which appeal inspection is requested cannot be positively identified by the inspector as the

lot from which officially drawn samples were previously inspected; or

(e) There is noncompliance with the regulations in this part. Such applicant shall be notified promptly of the reason for such refusal.

§ 170.40 *Who shall perform appeal inspection.* An appeal inspection shall be performed by an inspector or inspectors (other than the one from whose inspection the appeal is requested) authorized for this purpose by the Secretary and, whenever practical, such appeal inspection shall be conducted jointly by two such inspectors: *Provided*, That the inspector who made the inspection on which the appeal is requested may be authorized to draw the samples when another inspector or licensed sampler is not available in the area where the product is located.

§ 170.41 *Appeal inspection certificate.* After an appeal inspection has been completed, an appeal inspection certificate shall be issued showing the results of such appeal inspection; and such certificate shall supersede the inspection certificate previously issued for the processed product involved. Each appeal inspection certificate shall clearly identify the number and date of the inspection certificate which it supersedes. The superseded certificate shall become null and void upon the issuance of the appeal inspection certificate and shall no longer represent the quality or condition of the processed product described therein. The inspector or inspectors issuing an appeal inspection certificate shall forward notice of such issuance to such persons as he considers necessary to prevent misuse of the superseded certificate if the original and all copies of such superseded certificate have not previously been delivered to the inspector or inspectors issuing the appeal inspection certificate. The provisions in the regulations in this part concerning forms of certificates, issuance of certificates, and disposition of certificates shall apply to appeal inspection certificates, except that copies of such appeal inspection certificates shall be furnished all interested parties who received copies of the superseded certificate.

LICENSING OF SAMPLERS AND INSPECTORS

§ 170.47 *Who may become licensed sampler.* Any person deemed to have the necessary qualifications may be licensed as a licensed sampler to draw samples for the purpose of inspection under the regulations in this part. Such a license shall bear the printed signature of the Secretary, and shall be countersigned by an authorized employee of the Department. Licensed samplers shall have no authority to inspect processed products under the regulations in this part except as to identification and condition of the containers in a lot. A licensed sampler shall perform his duties pursuant to the regulations in this part as directed by the Director.

§ 170.48 *Application to become a licensed sampler.* Application to become a licensed sampler shall be made to the Secretary on forms furnished for that purpose. Each such application shall be signed by the applicant in his own hand-

writing, and the information contained therein shall be certified by him to be true, complete, and correct to the best of his knowledge and belief, and the application shall contain or be accompanied by:

(a) A statement showing his present and previous occupations, together with names of all employers for whom he has worked, with periods of service, during the ten years previous to the date of his application;

(b) A statement that, in his capacity as a licensed sampler, he will not draw samples from any lot of processed products with respect to which he or his employer is an interested party;

(c) A statement that he agrees to comply with all terms and conditions of the regulations in this part relating to duties of licensed samplers; and

(d) Such other information as may be requested.

§ 170.49 *Inspectors.* Inspections will ordinarily be performed by employees under the Secretary who are employed as Federal Government employees for that purpose. However, any person employed under any joint Federal-State inspection service arrangement may be licensed, if otherwise qualified, by the Secretary to make inspections in accordance with this part on such processed products as may be specified in his license. Such license shall be issued only in a case where the Secretary is satisfied that the particular person is qualified to perform adequately the inspection service for which such person is to be licensed. Each such license shall bear the printed signature of the Secretary and shall be countersigned by an authorized employee of the Department. An inspector shall perform his duties pursuant to the regulations in this part as directed by the Director.

§ 170.50 *Suspension or revocation of license of licensed sampler or licensed inspector.* Pending final action by the Secretary, the Director may, whenever he deems such action necessary, suspend the license of any licensed sampler, or licensed inspector, issued pursuant to the regulations in this part, by giving notice of such suspension to the respective licensee, accompanied by a statement of the reasons therefor. Within seven days after the receipt of the aforesaid notice and statement of reasons by such licensee, he may file an appeal, in writing, with the Secretary supported by any argument or evidence that he may wish to offer as to why his license should not be suspended or revoked. After the expiration of the aforesaid seven days period and consideration of such argument and evidence, the Secretary shall take such action as he deems appropriate with respect to such suspension or revocation.

§ 170.51 *Surrender of license.* Upon termination of his services as a licensed sampler or licensed inspector, or suspension or revocation of his license, such licensee shall surrender his license immediately to the office of inspection serving the area in which he is located. These same provisions shall apply in a case of an expired license.

SAMPLING

§ 170.57 *How samples are drawn by inspectors or licensed samplers.* An in-

spector or a licensed sampler shall select samples, upon request, from designated lots of processed products which are so placed as to permit thorough and proper sampling in accordance with the regulations in this part. Such person shall, unless otherwise directed by the Secretary, select sample units of such products at random, and from various locations in each lot in such manner and number, not inconsistent with the regulations in this part, as to secure a representative sample of the lot. Samples drawn for inspection shall be furnished by the applicant at no cost to the Department.

§ 170.58 *Accessibility for sampling.* Each applicant shall cause the processed products for which inspection is requested to be made accessible for proper sampling. Failure to make any lot accessible for proper sampling shall be sufficient cause for postponing inspection service until such time as such lot is made accessible for proper sampling.

§ 170.59 *How officially drawn samples are to be identified.* Officially drawn samples shall be marked by the inspector or licensed sampler so such samples can be properly identified for inspection.

§ 170.60 *How samples are to be shipped.* Unless otherwise directed by the Secretary, samples which are to be shipped to any office of inspection shall be forwarded to the office of inspection serving the area in which the processed products from which the samples were drawn is located. Such samples shall be shipped in a manner to avoid, if possible, any material change in the quality or condition of the sample of the processed product. All transportation charges in connection with such shipments of samples shall be at the expense of the applicant and wherever practicable, such charges shall be prepaid by him.

§ 170.61 *Sampling plans and procedures for determining lot compliance.*

(a) Except as otherwise provided for in this section in connection with in-plant inspection and unless otherwise approved by the Secretary, samples shall be selected from each lot in the exact number of sample units indicated for the lot size in the applicable single sampling plan or, at the discretion of the inspection service, any comparable multiple sampling plan; *Provided*, That at the discretion of the inspection service the number of sample units selected may be increased to the exact number of sample units indicated for any one of the larger sample sizes provided for in the appropriate plans.

(b) Under the single sampling plans with respect to any specified requirement:

(1) If the number of deviants (as defined in connection with the specific requirement) in the sample does not exceed the acceptance number prescribed for the sample size the lot meets the requirement;

(2) If the number of deviants (as defined in connection with the specific requirement) in the sample exceeds the acceptance number prescribed for the sample size the lot fails the requirement.

(c) Under the multiple sampling plans inspection commences with the smallest

sample size indicated under the appropriate plan and with respect to any specified requirement:

(1) If the number of deviants (as defined in connection with the specific requirement) in the sample being considered does not exceed the acceptance number prescribed for that sample size, the lot meets the requirement;

(2) If the number of deviants (as defined in connection with the specific requirement) in the sample being considered equals or exceeds the rejection number prescribed for that sample size, the lot fails the requirement; or

(3) If the number of deviants (as defined in connection with the specific requirement) in the sample being considered falls between the acceptance and rejection numbers of the plan, additional sample units are added to the sample so that the sample thus cumulated equals the next larger cumulative sample size in the plan. It may then be determined that the lot meets or fails the specific requirement by considering the cumulative sample and applying the procedures outlined in subparagraphs (1) and (2) of this paragraph or by considering successively larger samples cumulated in the same manner until the lot meets or fails the specific requirement.

(d) If in the conduct of any type of in-plant inspection the sample is examined before the lot size is known and the number of sample units exceeds the prescribed sample size for such lot but does not equal any of the prescribed larger sample sizes the lot may be deemed to meet or fail a specific requirement in accordance with the following procedure:

(1) If the number of deviants (as defined in connection with the specific requirement) in the nonprescribed sample does not exceed the acceptance number of the next smaller sample size the lot meets the requirements;

(2) If the number of deviants (as defined in connection with the specific requirement) in the nonprescribed sample equals the acceptance number prescribed for the next larger sample size additional sample units shall be selected to increase the sample to the next larger prescribed sample size;

(3) If the number of deviants (as defined in connection with the specific requirement) in the nonprescribed sample exceeds the acceptance number prescribed for the next larger sample size the lot fails the requirement.

(e) In the event that the lot compliance determination provisions of a standard or specification are based on the number of specified deviations instead of deviants the procedures set forth in this section may be applied by substituting the word "deviation" for the word "deviant" wherever it appears.

(f) Sampling plans referred to in this section are those contained in Tables I, II, III, IV, V, and VI which follow or any other plans which are applicable. For processed products not included in these tables, the minimum sample size shall be the exact number of sample units prescribed in the table, container group, and lot size that, as determined by the inspector, most closely resembles the product, type, container size and amount of product to be sampled.

SINGLE SAMPLING PLANS AND ACCEPTANCE LEVELS

TABLE I—CANNED OR SIMILARLY PROCESSED FISHERY PRODUCTS, AND PRODUCTS THEREOF CONTAINING UNITS OF SUCH SIZE AND CHARACTER AS TO BE READILY SEPARABLE

Container size group	Lot size (number of containers)								
GROUP 1									
Any type of container of less volume than that of a No. 300 size can (300 x 407).	3,600 or less...	3,601-14,400	14,401-48,000	48,001-96,000	96,001-156,000	156,001-228,000	228,001-300,000	300,001-420,000	Over 420,000.
GROUP 2									
Any type of container of a volume equal to or exceeding that of a No. 300 size can, but not exceeding that of a No. 3 cylinder size can (404 x 700).	2,400 or less...	2,401-12,000	12,001-24,000	24,001-48,000	48,001-72,000	72,001-108,000	108,001-168,000	168,001-240,000	Over 240,000.
GROUP 3									
Any type of container of a volume exceeding that of a No. 3 cylinder size can, but not exceeding that of a No. 12 size can (603 x 812).	1,200 or less...	1,201-7,200	7,201-15,000	15,001-24,000	24,001-36,000	36,001-60,000	60,001-84,000	84,001-120,000	Over 120,000.
GROUP 4									
Any type of container of a volume exceeding that of a No. 12 size can, but not exceeding that of a 5-gallon container.	200 or less...	201-800	801-1,600	1,601-2,400	2,401-3,600	3,601-6,000	6,001-16,000	16,001-28,000	Over 28,000.
GROUP 5									
Any type of container of a volume exceeding that of a 5-gallon container.	25 or less....	26-80	81-200	201-400	401-800	801-1,200	1,201-2,000	2,001-3,200	Over 3,200.

Single sampling plans¹

Sample size (number of sample units). ²	3	6	13	21	29	38	48	60	72
Acceptance number.....	0	1	2	3	4	5	6	7	8

¹ For extension of the single sample sizes beyond 72 sample units, refer to table V of this section; for multiple sampling plans comparable to the various single sampling plans refer to table VI of this section.

² The sample units for the various container size groups are as follows: Groups 1, 2, and 3—1 container and its entire contents. Groups 4 and 5—approximately 2 pounds of product. When determined by the inspector that a 2-pound sample unit is inadequate, a larger sample unit may be substituted.

TABLE II—FROZEN OR SIMILARLY PROCESSED FISHERY PRODUCTS, AND PRODUCTS THEREOF CONTAINING UNITS OF SUCH SIZE AND CHARACTER AS TO BE READILY SEPARABLE

Container size group	Lot size (number of containers)								
GROUP 1									
Any type of container of 1 pound or less net weight.	2,400 or less...	2,401-12,000	12,001-24,000	24,001-48,000	48,001-72,000	72,001-108,000	108,001-168,000	168,001-240,000	Over 240,000.
GROUP 2									
Any type of container over 1 pound but not over 4 pounds net weight.	1,800 or less...	1,801-8,400	8,401-18,000	18,001-36,000	36,001-60,000	60,001-96,000	96,001-132,000	132,001-168,000	Over 168,000.
GROUP 3									
Any type of container over 4 pounds but not over 10 pounds net weight.	900 or less...	901-3,600	3,601-10,800	10,801-18,000	18,001-36,000	36,001-60,000	60,001-84,000	84,001-120,000	Over 120,000.
GROUP 4									
Any type of container over 10 pounds but not over 100 pounds net weight.	200 or less...	201-800	801-1,600	1,601-2,400	2,401-3,600	3,601-6,000	6,001-16,000	16,001-28,000	Over 28,000.
GROUP 5									
Any type of container over 100 pounds net weight.	25 or less...	26-80	81-200	201-400	401-800	801-1,200	1,201-2,000	2,001-3,200	Over 3,200.

Single sampling plans¹

Sample size (number of sample units). ²	3	6	13	21	29	38	48	60	72
Acceptance number.....	0	1	2	3	4	5	6	7	8

¹ For extension of the single sample sizes beyond 72 sample units, refer to table V of this section; for multiple sampling plans comparable to the various single sampling plans refer to table VI of this section.

² The sample units for the various container size groups are as follows: Groups

1, 2, and 3—1 container and its entire contents. Groups 4 and 5—approximately 3 pounds of product. When determined by the inspector that a 3-pound sample unit is inadequate, a larger sample unit or 1 or more containers and their entire contents may be substituted for 1 or more sample units of 3 pounds.

SINGLE SAMPLING PLANS AND ACCEPTANCE LEVELS—Continued

TABLE III—CANNED, FROZEN, OR OTHERWISE PROCESSED FISHERY AND RELATED PRODUCTS, AND PRODUCTS THEREOF OF A COMMUNITED, FLUID, OR HOMOGENEOUS STATE

Container size group ¹	Lot size (number of containers)								
GROUP 1									
Any type of container of 12 ounces or less.	5,400 or less...	5,401-21,600	21,601-62,400	62,401-112,000	112,001-174,000	174,001-240,000	240,001-360,000	360,001-480,000	Over 480,000.
GROUP 2									
Any type of container over 12 ounces but not over 96 ounces.	3,600 or less...	3,601-14,400	14,401-48,000	48,001-96,000	96,001-156,000	156,001-228,000	228,001-300,000	300,001-420,000	Over 420,000.
GROUP 3									
Any type of container over 96 ounces but not over 160 ounces.	1,800 or less...	1,801-8,400	8,401-18,000	18,001-36,000	36,001-60,000	60,001-96,000	96,001-132,000	132,001-168,000	Over 168,000.
GROUP 4									
Any type of container over 160 ounces but not over 100 pounds or 100 pounds whichever is applicable.	200 or less...	201-800	801-1,600	1,601-3,200	3,201-8,000	8,001-16,000	16,001-24,000	24,001-32,000	Over 32,000.
GROUP 5									
Any type of container over 10 gallons or 100 pounds whichever is applicable.	25 or less...	26-80	81-200	201-400	401-800	801-1,200	1,201-2,000	2,001-3,200	Over 3,200.
Single sampling plans ²									
Sample size (number of sample units) ³	3	6	13	21	29	38	48	60	72
Acceptance number.....	0	1	2	3	4	5	6	7	8

¹ Ounces pertain to either fluid ounces of volume or avoirdupois ounces of net weight whichever is applicable for the product involved.

² For extension of the single sample sizes beyond 72 sample units, refer to table V of this section; for multiple sampling plans comparable to the various single sampling plans refer to table VI of this section.

³ The sample units for the various container size groups are as follows: Groups 1, 2, and 3—1 container and its entire contents. A smaller sample unit may be substituted in group 3 at the inspector's discretion. Groups 4, 5, and 6—approximately 16 ounces of product. When determined by the inspector that a 16-ounce sample unit is inadequate, a larger sample unit may be substituted.

TABLE IV—DEHYDRATED FISHERY AND RELATED PRODUCTS

Container size group	Lot size (number of containers)								
GROUP 1									
Any type of container of 1 pound or less net weight.	1,800 or less...	1,801-8,400	8,401-18,000	18,001-36,000	36,001-60,000	60,001-96,000	96,001-132,000	132,001-168,000	Over 168,000.
GROUP 2									
Any type of container over 1 pound but not over 6 pounds net weight.	900 or less...	901-3,600	3,601-10,800	10,801-18,000	18,001-36,000	36,001-60,000	60,001-84,000	84,001-120,000	Over 120,000.
GROUP 3									
Any type of container over 6 pounds but not over 20 pounds net weight.	200 or less...	201-800	801-1,600	1,601-3,200	3,201-8,000	8,001-16,000	16,001-24,000	24,001-32,000	Over 32,000.
GROUP 4									
Any type of container over 20 pounds but not over 100 pounds net weight.	48 or less...	49-400	401-1,200	1,201-2,000	2,001-2,800	2,801-6,000	6,001-8,000	8,001-12,000	Over 15,000.
GROUP 5									
Any type of container over 100 pounds net weight.	16 or less...	17-80	81-200	201-400	401-800	801-1,200	1,201-2,000	2,001-3,200	Over 3,200.
Single sampling plans ²									
Sample size (number of sample units) ³	3	6	13	21	29	38	48	60	72
Acceptance number.....	0	1	2	3	4	5	6	7	8

¹ For extension of the single sample sizes beyond 72 sample units, refer to table V of this section; for multiple sampling plans comparable to the various single sampling plans refer to table VI of this section.

² The sample units for the various container size groups are as follows: Group 1—1 container and its entire contents. Groups 2, 3, 4, and 5—1 container and its entire contents or a smaller sample unit when determined by the inspector to be adequate.

TABLE V—SINGLE SAMPLING PLANS FOR USE IN INCREASING SAMPLE SIZE BEYOND 72 SAMPLE UNITS

Sample size, n.....	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	272	288	300	312	324	336	348	360	372	384	400
Acceptance numbers, c.....	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34

MULTIPLE SAMPLING PLANS¹

TABLE VI—MULTIPLE SAMPLING PLANS COMPARABLE TO THE INDICATED SINGLE SAMPLING PLANS

Indicated single sampling plan:	6	13	21	29	38	48	60	72
Single sample size, <i>n</i>	1	2	3	4	5	6	7	8
Acceptance numbers, <i>c</i>	1	2	3	4	5	6	7	8
Cumulative sample sizes, <i>n</i> , and acceptance numbers, <i>c</i> , and rejection numbers, <i>r</i> , for multiple sampling.	<i>n</i> , <i>c</i> , <i>r</i> 4 0 2 6 0 2 8 1 2	<i>n</i> , <i>c</i> , <i>r</i> 8 0 3 10 0 3 12 1 3 14 2 3	<i>n</i> , <i>c</i> , <i>r</i> 10 0 3 14 1 4 18 1 4 22 2 5	<i>n</i> , <i>c</i> , <i>r</i> 12 0 4 16 0 4 20 1 5 24 2 6 28 3 6 32 3 6 36 5 6	<i>n</i> , <i>c</i> , <i>r</i> 14 0 4 20 0 5 26 1 6 32 2 6 38 3 7 44 4 7	<i>n</i> , <i>c</i> , <i>r</i> 16 0 4 24 1 6 32 2 6 40 3 8 48 4 8 56 7 8	<i>n</i> , <i>c</i> , <i>r</i> 18 0 5 28 1 6 38 2 7 48 3 8 58 4 8 68 8 9	<i>n</i> , <i>c</i> , <i>r</i> 22 0 5 32 1 7 42 2 8 52 3 9 62 5 10 72 6 10 82 9 10

¹ These multiple sampling plans may be used in lieu of the single sampling plans listed at the heading of each column.

§ 170.62 Issuance of certificate of sampling. Each inspector and each licensed sampler shall prepare and sign a certificate of sampling to cover the samples drawn by the respective person, except that an inspector who inspects the samples which he has drawn need not prepare a certificate of sampling. One copy of each certificate of sampling prepared shall be retained by the inspector or licensed sampler (as the case may be) and the original and all other copies thereof shall be disposed of in accordance with the instructions of the Secretary.

§ 170.63 Identification of lots sampled. Each lot from which officially drawn samples are selected shall be marked in such manner as may be prescribed by the Secretary, if such lots do not otherwise possess suitable identification.

FEEES AND CHARGES

§ 170.69 Payment of fees and charges. Fees and charges for any inspection service shall be paid by the interested party making the application for such service, in accordance with the applicable provisions of the regulations in this part, and, if so required by the person in charge of the office of inspection serving the area where the services are to be performed, an advance of funds prior to rendering inspection service in an amount suitable to the Secretary, or a surety bond suitable to the Secretary, may be required as a guarantee of payment for the services rendered. All fees and charges for any inspection service performed pursuant to the regulations in this part shall be paid by check, draft, or money order payable to the Treasurer of the United States and remitted to the office of inspection serving the area in which the services are performed, within ten (10) days from the date of billing, unless otherwise specified in a contract between the applicant and the Secretary, in which later event the contract provisions shall apply.

§ 170.70 Schedule of fees. (a) Unless otherwise provided in a written agreement between the applicant and the Secretary, the fees to be charged and collected for any inspection service performed under the regulations in this part at the request of the United States, or any agency or instrumentality thereof, shall be at the rate of \$4.50 per hour. (b) Unless otherwise provided in the regulations in this part, the fees to be charged and collected for any inspection

service performed under the regulations in this part shall be based on the applicable rates specified in this section.²

(1) *Canned or similarly processed fishery products, and products thereof.*

OFFICIALLY DRAWN SAMPLES

For each lot packed in containers of a volume not exceeding that of a No. 12 size can (603 x 812):

Minimum fee for 600 cases or less..... \$0.00

For each additional 100 cases, or fraction thereof, in excess of 600 cases but not in excess of 10,000 cases..... \$1.00

For each additional 100 cases, or fraction thereof, in excess of 10,000 cases..... \$2.00

² However, the fee for any additional lots of 200 cases or less which are offered for inspection by the same applicant at the same time and which are available for inspection at the same time and place shall be \$6.75.

³ The fees specified in this section are exclusive of charges for such micro, chemical and certain other special analyses, other than salt and acidity by direct titration, soluble solids (by refractometer) or total solids (by refractometer), which may be requested by the applicant or required by the inspector to determine the quality or condition of the processed product.

UNOFFICIALLY DRAWN SAMPLES

For containers of a volume not exceeding that of a No. 3 size can (404 x 414):

Minimum fee for 4 containers or less \$4.50

For each additional container in excess of 4 containers..... 1.00

For containers of a volume exceeding that of a No. 3 size can (404 x 414), but not exceeding that of a No. 12 size can (603 x 812):

Minimum fee for 2 containers or less \$4.50

For each additional container in excess of 2 containers..... 2.00

(2) *Other processed food products.*

The fee to be charged and collected for the inspection of any processed product not included in subparagraph (1) of this paragraph shall be at the rate of \$4.50 per hour for the time consumed by the inspector in making the inspection, including the time consumed in sampling by the inspector or licensed sampler: *Provided*, That, fees for sampling time will not be assessed by the office of inspection when such fees have been assessed and collected directly from the applicant by a licensed sampler.

§ 170.71 Fees to be charged and collected for sampling when performed by a licensed sampler. Such sampling fees as are specifically prescribed by the Sec-

retary in connection with the licensing of the particular sampler (which fees are to be prescribed in the light of the sampling work to be performed by such sampler and other pertinent factors) may be assessed and collected by such licensed sampler directly from the applicant: *Provided*, That if such licensed sampler is an employee of a State, the appropriate authority of that State may make the collection, or they may be assessed and collected by the office of inspection serving the area where the services are performed.

§ 170.72 Inspection fees when charges for sampling have been collected by a licensed sampler. For each lot of processed products from which samples have been drawn by a licensed sampler and with respect to which the sampling fee has been collected by the licensed sampler, the fee to be charged for the inspection shall be 75 percent of the fee provided in this part applicable to the respective processed product: *Provided*, That, if the fee charged for the inspection service is based on the hourly rate of charge, the fee shall be at the rate of \$4.50 per hour prescribed in this part.

§ 170.73 Inspection fees when charges for sampling have not been collected by a licensed sampler. For each lot of processed products from which samples have been drawn by a licensed sampler, and with respect to which the sampling fee has not been collected by the licensed sampler, the fee to be charged for the inspection shall be 75 percent of the fee as prescribed in this part, plus a reasonable charge to cover the cost of sampling as may be determined by the Secretary: *Provided*, That, if the fee charged is based on the hourly rate, the fee shall be at the rate of \$4.50 per hour prescribed in this part, plus a reasonable charge to cover the cost of sampling, as determined by the Secretary.

§ 170.74 Fee for appeal inspection. The fee to be charged for an appeal inspection shall be at the rates prescribed in this part for other inspection services: *Provided*, That, if the result of any appeal inspection made for any applicant, other than the United States or any agency or instrumentality thereof, discloses that a material error was made in the inspection on which the appeal is made, no inspection fee shall be assessed.

§ 170.75 Charges for micro, chemical, and certain other special analyses. (a) The following charges shall be made for

micro, chemical, and certain other special analyses which may be requested by the applicant or required by the inspector to determine the quality or condition of the processed product:^a

Type of analysis	For first analysis	For each additional analysis
Mold count.....	\$1.50	\$1.50
Worm larvae and insect fragment count.....	3.00	3.00
Fly egg and maggot count.....	3.00	3.00
Alcohol insoluble solids.....	5.00	3.00
Alcohol (distillation and specific gravity).....	9.00	5.00
Ascorbic acid (vitamin C).....	9.00	2.00
Total ash (carbonated or sulfated).....	5.00	3.00
Ash, acid insoluble.....	6.00	3.00
Ash, water soluble or water insoluble.....	6.00	3.00
Ash, NaCl free (approximate method—total ash less NaCl).....	9.00	3.00
Ash, NaCl free (FeO _x x 2).....	15.00	6.00
Catalase test.....	3.00	1.50
Crude fiber.....	12.00	6.00
Ether extract (crude fat).....	9.00	5.00
Fat (acid hydrolysis).....	9.00	6.00
Fiber (green and water bean).....	6.00	3.00
Iodine number.....	9.00	4.50
Moisture (air oven method).....	3.00	3.00
Moisture (vacuum oven method).....	3.00	3.00
Nitrogen or crude protein.....	9.00	3.00
Non-volatile ether extract.....	9.00	4.50
Phosphorous pentoxide (P ₂ O ₅).....	15.00	6.00
Potash (K ₂ O).....	15.00	6.00
Phosphorous pentoxide (P ₂ O ₅) and aluminum trioxide (Al ₂ O ₃).....	18.00	12.00
Recoverable oil.....	3.00	2.00
Peroxidase test (frozen vegetables).....	4.50	3.00
Reducing sugars.....	12.00	6.00
Reducing sugars plus sucrose.....	18.00	12.00
Sucrose (direct polarization).....	6.00	3.00
Sucrose (chemical methods).....	18.00	12.00
Starch or carbohydrates (direct hydrolysis).....	18.00	9.00
Sulphur dioxide (direct titration).....	5.00	3.00
Sulphur dioxide (distillation method).....	9.00	5.00
Sodium.....	13.50	4.50
Total solids (drying method).....	3.00	3.00
Vanillin.....	12.00	9.00
Volatile and non-volatile ether extract.....	10.00	6.00
Water extract.....	5.00	6.00

(b) The following charges shall be made for analyses which are requested by an applicant and are not in connection with an inspection to determine the quality or condition of the product:^a

Type of analysis	For first analysis	For each additional analysis
Brix readings (refractometric or spindle).....	\$3.00	\$1.00
Brix readings (double dilution).....	3.00	2.00
Total acidity (direct titration).....	3.00	1.00
Free fatty acids.....	4.50	1.50
Salt (NaCl)—direct titration.....	4.50	1.50
Soluble solids (refractometric method).....	3.00	1.00
Total solids (refractometric method).....	3.00	1.00

^a § 170.76 When charges are to be based on hourly rate not otherwise provided for in this part. When inspection is for condition only or when inspection services or related services are rendered and formal certificates are not issued or when the services rendered are such that charges based upon the foregoing sections would be inadequate or inequitable, charges may be based on the time consumed by the inspector in performance of such inspection service at the rate of \$4.50 per hour.

^a When any of these analyses are made at the request of an applicant and are not in connection with an inspection to determine the quality or condition of the product, the listed fees shall be increased by 30 percent.

^a When these analyses are made in connection with an inspection to determine the quality or condition of the product no fee shall be charged for the analyses.

§ 170.77 Fees for score sheets. If the applicant for inspection service requests score sheets showing in detail the inspection of each container or sample inspected and listed thereon, such score sheets may be furnished by the inspector in charge of the office of inspection serving the area where the inspection was performed; and such applicant shall be charged at the rate of \$2.25 for each twelve sample units, or fraction thereof, inspected and listed on such score sheets.

§ 170.78 Fees for additional copies of inspection certificates. Additional copies of any inspection certificate other than those provided for in § 170.29, may be supplied to any interested party upon payment of a fee of \$2.25 for each set of five (5) or fewer copies.

§ 170.79 Travel and other expenses. Charges may be made to cover the cost of travel and other expenses incurred in connection with the performance of any inspection service, including appeal inspections: *Provided*, That, if charges for sampling or inspection are based on an hourly rate, an additional hourly charge may be made for travel time including time spent waiting for transportation as well as time spent traveling, but not to exceed eight hours of travel time for any one person for any one day: *And provided further*, That, if travel is by common carrier, no hourly charge may be made for travel time outside the employee's official work hours.

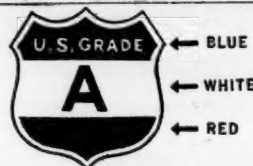
§ 170.80 Charges for inspection service on a contract basis. (a) Irrespective of fees and charges prescribed in foregoing sections, the Secretary may enter into contracts with applicants to perform continuous inspection services or other inspection services pursuant to the regulations in this part and other requirements as prescribed by the Secretary in such contract, and the charges for such inspection service provided in such contracts shall be on such basis as will reimburse the Bureau of Commercial Fisheries of the Department for the full cost of rendering such inspection service including an appropriate overhead charge to cover as nearly as practicable administrative overhead expenses as may be determined by the Secretary.

(b) Irrespective of fees and charges prescribed in the foregoing sections, the Secretary may enter into a written memorandum of understanding or contract, whichever may be appropriate, with any administrative agency charged with the administration of a marketing agreement or a marketing order effective pursuant to the Agricultural Marketing Agreement Act of 1937, as revised (16 U. S. C. 661 et seq.) for the making of inspections pursuant to said agreement or order on such basis as will reimburse the Bureau of Commercial Fisheries of the Department for the full cost of rendering such inspection service including an appropriate overhead charge to cover as nearly as practicable administrative overhead expenses as may be determined by the Secretary. Likewise, the Secretary may enter into a written memorandum of understanding or contract, whichever may be appropriate, with an administrative agency charged with the administration of a similar program operated pursuant to the laws of any State.

(c) No Member of, or Delegate to Congress, or Resident Commissioner, shall be admitted to any share or part of any contract provided for in this section or to any benefit that may arise therefrom, but this provision shall not be construed to extend to such contract if made with a corporation for its general benefit, and shall not extend to any benefits that may accrue from the contract to a Member of, or Delegate to Congress, or a Resident Commissioner in his capacity as a fisherman.

MISCELLANEOUS

§ 170.86 Approved identification—(a) Grade marks. The approved grade mark or identification may be used on containers, labels or otherwise indicated for any processed product that (1) has been packed under continuous inspection as provided in this part to assure compliance with the requirements for wholesomeness established for the raw product and of sanitation established for the preparation and processing operations, and (2) has been certified by an inspector as meeting the requirements of such grade, quality or classification. The grade marks approved for use shall be similar in form and design to the examples in Figures 1 through 4 of this section.



Shield using red, white, and blue background or other colors appropriate for label.

FIGURE 1.



Shield with plain background.

FIGURE 2.

U. S. GRADE A

FIGURE 3.

U. S.
GRADE
B

FIGURE 4.

(b) Inspection marks. The approved inspection marks may be used on containers, labels or otherwise indicated for

any processed product that (1) has been packed under continuous inspection as provided in this part to assure compliance with the requirements for wholesomeness established for the raw product and of sanitation established for the preparation and processing operations, and (2) has been certified by an inspector as meeting the requirements of such quality or grade classification as may be approved by the Secretary. The inspection marks approved for use shall be similar in form and design to the examples in Figures 5, 6, and 7 of this section.



Statement enclosed within a shield.

FIGURE 5.

(c) *Combined grade and inspection marks.* The grade marks set forth in paragraph (a) of this section and the inspection marks set forth in paragraph (b) of this section may be combined into a consolidated grade and inspection mark for use on processed products that have been packed under continuous inspection as provided in this part.

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FIGURE 6.

(d) *Products not eligible for approved identification.* Processed products which have not been packed under continuous inspection as provided in this part shall not be identified by approved grade or inspection marks, but such products may be inspected on a lot inspection basis as provided in this part and identified by an authorized representative of the Department by stamping the shipping cases and inspection certificate(s) covering such lot(s) with an officially drawn sample mark similar in form and design to the example in Figure 8 of this section.



FIGURE 8.

§ 170.87 *Fraud or misrepresentation.* Any or all benefits of the act may be denied any person committing wilful misrepresentation or any deceptive or fraudulent practice in connection with:

- (a) The making or filing of an application for any inspection service;
- (b) The submission of samples for inspection;
- (c) The use of any inspection report or any inspection certificate, or appeal inspection certificate issued under the regulations in this part;
- (d) The use of the words "Packed under continuous inspection of the U. S. Department of the Interior," any legend signifying that the product has been officially inspected, any statement of grade or words of similar import in the labeling or advertising of any processed product;
- (e) The use of a facsimile form which simulates in whole or in part any official U. S. certificate for the purpose of purporting to evidence the U. S. grade of any processed product; or
- (f) Any wilful violation of the regulations in this part or supplementary rules or instructions issued by the Secretary.

§ 170.88 *Political activity.* All inspectors and licensed samplers are forbidden, during the period of their respective appointments or licenses, to take an active part in political management or in political campaigns. Political activities in city, county, State, or national elections, whether primary or regular, or in behalf of any party or candidate, or any meas-

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FIGURE 7.

ure to be voted upon, are prohibited. This applies to all appointees or licensees, including, but not limited to, temporary and cooperative employees and employees on leave of absence with or without pay. Wilful violation of this section will constitute grounds for dismissal in the case of appointees and revocation of licenses in the case of licensees.

§ 170.89 *Interfering with an inspector or licensed sampler.* Any further benefits of the act may be denied any applicant or other interested party who either personally or through an agent or representative interferes with or obstructs, by intimidation, threats, assault, or in any other manner, an inspector or licensed sampler in the performance of his duties.

§ 170.90 *Compliance with other laws.* None of the requirements in the regulations in this part shall excuse failure to comply with any Federal, State, county, or municipal laws applicable to the operation of food processing establishments and to processed food products.

§ 170.91 *Identification.* Each inspector and licensed sampler shall have in his possession at all times and present upon request, while on duty, the means of identification furnished by the Department to such person.

REQUIREMENTS FOR PLANTS OPERATING UNDER CONTINUOUS INSPECTION ON A CONTRACT BASIS*

§ 170.97 *Plant survey.* (a) Prior to the inauguration of continuous inspection service on a contract basis, the Secretary will make, or cause to be made, a survey and inspection of the plant where such service is to be performed to determine whether the plant and methods of operation are suitable and adequate for the performance of such services in accordance with:

- (1) The regulations in this part, including, but not limited to, the requirements contained in §§ 170.97 through 170.103; and
- (2) The terms and provisions of the contract pursuant to which the service is to be performed.

§ 170.98 *Premises.* The premises of the plant shall be free from conditions objectionable to food processing operations; and such conditions include, but are not limited to, the following:

- (a) Strong offensive odors;
- (b) Litter, waste, and refuse (e. g., garbage, viner refuse, and damaged containers) within the immediate vicinity of the plant buildings or structures;
- (c) Excessively dusty roads, yards, or parking lots; and
- (d) Poorly drained areas.

§ 170.99 *Buildings and structures.* The plant buildings and structures shall be properly constructed and maintained in a sanitary condition, including, but not being limited to, the following requirements:

- (a) There shall be sufficient light (1) consistent with the use to which the particular portion of the building is devoted and (2) to permit efficient cleaning. Belts and tables on which picking, sorting, or trimming operations are carried on shall be provided with sufficient nonglaring light to insure adequacy of the respective operation.

(b) If practicable, there shall be sufficient ventilation in each room and compartment thereof to prevent excessive condensation of moisture and to insure sanitary and suitable processing and operating conditions. If such ventilation does not prevent excessive condensation, the Secretary may require that suitable facilities be provided to prevent the condensate from coming in contact with equipment used in processing operations and with any ingredient used in the manufacture or production of a processed product.

(c) There shall be an efficient waste disposal and plumbing system. All drains and gutters shall be properly installed with approved traps and vents, and shall be maintained in good repair and in proper working order.

(d) There shall be ample supply of both hot and cold water; and the water shall be of safe and sanitary quality with adequate facilities for its (1) distribution throughout the plant, and (2) protection against contamination and pollution.

* Compliance with the above requirements does not excuse failure to comply with all applicable sanitary rules and regulations of city, county, State, Federal, or other agencies having jurisdiction over such plants and operations.

(e) Roofs shall be weather-tight. The walls, ceilings, partitions, posts, doors, and other parts of all buildings and structures shall be of such materials, construction, and finish as to permit their efficient and thorough cleaning. The floors shall be constructed of tile, cement, or other equally impervious material, shall have good surface drainage, and shall be free from openings or rough surfaces which would interfere with maintaining the floors in a clean condition.

(f) Each room and each compartment in which any processed products are handled, processed, or stored (1) shall be so designed and constructed as to insure processing and operating conditions of a clean and orderly character; (2) shall be free from objectionable odors and vapors; and (3) shall be maintained in a clean and sanitary condition.

(g) Every practical precaution shall be taken to exclude dogs, cats, and vermin (including, but not being limited to, rodents and insects) from the rooms in which processed products are being prepared or handled and from any rooms in which ingredients (including, but not being limited to, salt, sugar, spices, flour, syrup, and fishery products) are handled or stored. Screens, or other devices, adequate to prevent the passage of insects shall, where practical, be provided for all outside doors and openings. The use of poisonous cleansing agents, insecticides, bactericides, or rodent poisons shall not be permitted except under such precautions and restrictions as will prevent any possibility of their contamination of the processed product.

§ 170.100 *Facilities.* Each plant shall be equipped with adequate sanitary facilities and accommodations, including, but not being limited to, the following:

(a) There shall be a sufficient number of adequately lighted toilet rooms, ample in size, and conveniently located. Such rooms shall not open directly into rooms or compartments in which processed products are being manufactured or produced, or handled. Toilet rooms shall be adequately screened and equipped with self-closing doors and shall have independent outside ventilation.

(b) Lavatory accommodations (including, but not being limited to, running water, single service towels, and soap) shall be placed at such locations in or near toilet rooms and in the manufacturing or processing rooms or compartments as may be necessary to assure the cleanliness of each person handling ingredients used in the manufacture or production of processed products.

(c) Containers intended for use as containers for processed products shall not be used for any other purpose.

(d) No product or material which creates an objectionable condition shall be processed, handled, or stored in any room, compartment, or place where any processed product is manufactured, processed, or handled.

(e) Suitable facilities for cleaning (e. g., brooms, brushes, mops, clean cloths, hose, nozzles, soaps, detergent, sprayers, and steam pressure hose and guns) shall be provided at convenient locations throughout the plant.

§ 170.101 *Equipment.* All equipment used for receiving, washing, segregating, picking, processing, packaging, or storing any processed products or any ingredients used in the manufacture or production thereof, shall be of such design, material, and construction as will:

(a) Enable the examination, segregation, preparation, packaging and other processing operations applicable to processed products, in an efficient, clean, and sanitary manner, and

(b) Permit easy access to all parts to insure thorough cleaning and effective bactericidal treatment. Insofar as is practicable, all such equipment shall be made of corrosion-resistant material that will not adversely affect the processed product by chemical action or physical contact. Such equipment shall be kept in good repair and sanitary condition.

§ 170.102 *Operations and operating procedures.* (a) All operations in the receiving, transporting, holding, segregating, preparing, processing, packaging and storing of processed products and ingredients, used as aforesaid, shall be strictly in accord with clean and sanitary methods and shall be conducted as rapidly as practicable and at temperatures that will not tend to cause (1) any material increase in bacterial or other micro-organic content, or (2) any deterioration or contamination of such processed products or ingredients thereof. Mechanical adjustments or practices which may cause contamination of foods by oil, dust, paint, scale, fumes, grinding materials, decomposed food, filth, chemicals, or other foreign materials shall not be conducted during any manufacturing or processing operation.

(b) All processed products and ingredients thereof shall be subjected to continuous inspection throughout each manufacturing or processing operation. All processed products which are not manufactured or prepared in accordance with the requirements contained in §§ 170.97 through 170.103 or are not fit for human food shall be removed and seg-

regated prior to any further processing operation.

(c) All ingredients used in the manufacture or processing of any processed product shall be clean and fit for human food.

(d) The methods and procedures employed in the receiving, segregating, handling, transporting, and processing of ingredients in the plant shall be adequate to result in a satisfactory processed product. Such methods and procedures include, but are not limited to, the following requirements:

(1) Containers, utensils, pans, and buckets used for the storage or transporting of partially processed food ingredients shall not be nested unless re-washed before each use;

(2) Containers which are used for holding partially processed food ingredients shall not be stacked in such manner as to permit contamination of the partially processed food ingredients;

(3) Packages or containers for processed products shall be clean when being filled with such products; and all reasonable precautions shall be taken to avoid soiling or contaminating the surface of any package or container liner which is, or will be, in direct contact with such products. If, to assure a satisfactory finished product, changes in methods and procedures are required by the Secretary, such changes shall be effected as soon as practicable.

§ 170.103 *Personnel; health.* In addition to such other requirements as may be prescribed by the Secretary with respect to persons in any room or compartment where exposed ingredients are prepared, processed, or otherwise handled, the following shall be complied with:

(a) No person affected with any communicable disease (including, but not being limited to, tuberculosis) in a transmissible stage shall be permitted;

(b) Infections or cuts shall be covered with rubber gloves or other suitable covering;

(c) Clean, suitable clothing shall be worn;

(d) Hands shall be washed immediately prior to starting work and each resumption of work after each absence from the work station;

(e) Spitting, and the use of tobacco are prohibited; and

(f) All necessary precautions shall be taken to prevent the contamination of processed products and ingredients thereof with any foreign substance (including, but not being limited to, perspiration, hair, cosmetics, and medications).



Department of Labor

WAGE AND HOUR DIVISION

AMERICAN SAMOA MINIMUM WAGE ORDER INCLUDES WAGE RATES FOR

FISH CANNING AND PROCESSING INDUSTRY:

In accordance with an investigation and a hearing conducted by a special industry committee and its recommendations, the Department of Labor published minimum

wage rates to be paid to employees in American Samoa, who are engaged in commerce or in the production of goods in commerce. Included are minimum

wage rates for the fish canning and processing industry in American Samoa. The order as it appeared in the June 6, 1958, Federal Register follows:

TITLE 29—LABOR

Chapter V—Wage and Hour Division, Department of Labor

PART 697—INDUSTRIES IN AMERICAN SAMOA, MINIMUM WAGE ORDER

Pursuant to section 5 of the Fair Labor Standards Act, of 1938, as amended (52 Stat. 1062, as amended; 29 U. S. C. 205), the Secretary of Labor by Administrative Order No. 502 (23 F. R. 1604), appointed, convened, and gave notice of the hearing of Special Industry Committee No. 2 for American Samoa to recommend the minimum wage rate or rates to be paid under section 6 (a) (3) of that act (70 Stat. 1118, 29 U. S. C., Supp. V, 206 (a) (3)) to employees in American Samoa, who are engaged in commerce or in the production of goods for commerce.

Subsequent to an investigation and a hearing conducted pursuant to the notice, the committee filed with the Acting Administrator a report containing its findings with respect to the matters referred to it.

Accordingly, as authorized and required by section 8 of the Fair Labor Standards Act of 1938, as amended, (52 Stat. 1064, as amended; 29 U. S. C. 208), Reorganization Plan No. 6 of 1950 (64 Stat. 1283; 3 CFR, 1950 Supp., p. 165), and General Orders Nos. 45-A (15 F. R. 3290) and 85-A (22 F. R. 7614) of the Secretary of Labor, the recommendations of the Committee are published in this order amending Part 697 of Title 29 of the Code of Federal Regulations, effective June 21, 1958, to read as follows:

Sec.

697.1 Definitions of Industries in American Samoa.

697.2 Wage rates.

697.3 Notices.

AUTHORITY: §§ 697.1 to 697.3 issued under sec. 8, 52 Stat. 1064, as amended; 29 U. S. C.

208. Interpret or apply secs. 5, 6, 52 Stat. 1062, as amended; 29 U. S. C. 205, 206.

§ 697.1 *Definitions of the industries in American Samoa.* The industries in American Samoa to which this part shall apply are hereby defined as follows:

(a) *Fish canning and processing industry.* This industry shall include the canning, freezing, preserving or other processing of any kind of fish, shellfish, or other aquatic forms of animal life and the manufacture of any by-product thereof.

(b) *Shipping and transportation industry.* This industry shall include the transportation of passengers and cargo by water or by air and all activities in connection therewith, including, but not by way of limitation, the operation of air terminals, piers, wharves and docks, including stevedoring, storage, and lighterage operations, and the operation of tourist bureaus and travel ticket agencies: *Provided, however,* That this definition shall not include bunkering of petroleum products.

(c) *Petroleum marketing industry.* This industry shall include the wholesale marketing and distribution of gasoline, kerosene, lubricating oils, diesel and marine fuels, and other petroleum products, including bunkering operations in connection therewith, and repair and maintenance of storage facilities.

(d) *Miscellaneous industries.* Miscellaneous industries shall include all operations and activities not included in the shipping and transportation industry, the petroleum marketing industry, or the fish canning and processing industry, as defined herein.

§ 697.2 *Wage rates.* (a) Wages at a rate of not less than 52 cents an hour shall be paid under section 6 of the Fair Labor Standards Act of 1938, by every

employer to each of his employees in the fish canning and processing industry in American Samoa, who is engaged in commerce or in the production of goods for commerce.

(b) Wages at a rate of not less than 50 cents an hour shall be paid under section 6 of the Fair Labor Standards Act of 1938, by every employer to each of his employees in the shipping and transportation industry in American Samoa, who is engaged in commerce or in the production of goods for commerce.

(c) Wages at a rate of not less than 52 cents an hour shall be paid under section 6 of the Fair Labor Standards Act of 1938, by every employer to each of his employees in the petroleum marketing industry in American Samoa, who is engaged in commerce or in the production of goods for commerce.

(d) Wages at a rate of not less than 38 cents per hour shall be paid under section 6 of the Fair Labor Standards Act of 1938, by every employer to each of his employees in the miscellaneous industries in American Samoa, who is engaged in commerce or in the production of goods for commerce.

§ 697.3 *Notices.* Every employer subject to the provisions of § 697.2 shall post in a conspicuous place in each department of his establishment where employees subject to the provisions of § 697.2 are working such notices of this part as shall be prescribed from time to time by the Administrator of the Wage and Hour and Public Contracts Divisions of the United States Department of Labor, and shall give such other notice as the Administrator may prescribe.

Signed at Washington, D. C., this 2d day of June 1958.

CLARENCE T. LUNDQUIST,
Acting Administrator.



Eighty-Fifth Congress (Second Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions, hearings, and other chamber actions by the House and Senate, as well as signature into law or other final disposition are covered.



ALASKA STATEHOOD: H. R. 7999, providing for the admission of Alaska into the Union as a state, was passed by the House May 28, 1958. The bill as passed contains the proviso: "Provided, that the administration and management of the fish and wildlife resources of Alaska shall be retained by the Federal Government under existing laws until the first day of the first calendar year following the expiration of 90 legislative days after the Secretary of the Interior certifies to the Congress that the Alaska State Legislature has made adequate provision for the administration, management, and conservation of said resources in the broad national interest." In the Senate the bill was placed on the calendar on May 29, 1958.

ANTIDUMPING ACT OF 1921: H. R. 6006 (Cooper) a bill to amend the Antidumping Act of 1921,

and for other purposes, introduced in the First Session of the 85th Congress and passed by the House on August 29, 1957, was reported (S. Rept. 1619) on May 21, 1958, by the Senate Committee on Finance. The bill passed the Senate with committee amendments on May 26, 1958, and was returned to the House.

Senate Report No. 1619, Antidumping Act, 1921, (May 21, 1958, 85th Congress, 2nd Session, Report of the Committee on Finance to accompany H. R. 6006), 18 pp., printed. The Report by the Senate Committee presents the purpose, principal features, analysis, and a section-by-section explanation of the bill, as well as changes in existing law. Principal features of H. R. 6006 are as follows: (1) Assessment of dumping duties: Assessment of dumping duties is provided for in the present law if there are (a) sales at less than fair value of imported merchandise and (b) injury to an industry in the United States resulting therefrom. Due to the wording of section 205 of the present law defining "foreign market value" and to Treasury rulings and court decisions construing this wording, it is possible for situations to arise where sales at less than fair value and injury are found, but where no duties can be collected. The bill would revise this wording and is thus designed to put an end to this anomalous situation which can presently arise. (2) Definitions: The new definitions of certain terms enacted in the Customs Simplification Act of 1956 (Public Law 927, 84th Cong.) would be incorporated into the Antidumping Act by the bill, with occasional modifications necessitated by the differences between the process of valuation for ordinary duties and the calculation of dumping duties. Customs officials would thereby be enabled in large measure to apply a similar set of definitions both in the calculation of ordinary duties and of dumping duties. (3) Public notice and reports: Provision is made in the bill for mandatory public notice when there is reason to believe or suspect sales of imported merchandise at a dumping price, and mandatory public notice by the Treasury Department and the Tariff Commission of their decisions in dumping cases, whether affirmative or negative, with reasons therefor.

CHEMICAL ADDITIVES IN FOOD: Food Additives (Hearings before a Subcommittee of the Committee on Interstate and Foreign Commerce, House of Representatives, 85th Congress, on Bills to Amend the Federal Food, Drug, and Cosmetic Act with Respect to Chemical Additives in Food, July 15-24 and August 6-7, 1958, and April 15, 1958, 533 pp., printed). Includes texts of H. R. 366 (O'Hara), H. R. 6747 (Harris), H. R. 7700 (Fulton), H. R. 7798 (Delaney), H. R. 8112 (Miller, Nebraska), H. R. 8390 (Harris), and H. R. 10404 (Williams of Miss.), all related bills on chemical additives to food. Also contains an analysis of the principal features of the chemical additives bills and testimony and statements submitted for the record by government officials, numerous associations and industrial firms, and individuals (See *Commercial Fisheries Review*, March 1958, p. 63 for additional information on these bills.)

EXEMPT TRUCK USE TO BE LIMITED: S. 3778 (Smathers) introduced in the Senate on May 8, 1958, a bill to amend the Interstate Commerce Act, as amended, so as to strengthen and improve the na-

tional transportation system, and for other purposes; to the Committee on Interstate and Foreign Commerce. This bill labeled "Transportation Act of 1958" is a committee bill and designed primarily to aid the railroads, but contains some provisions that would curtail the use of exempt trucks for the transportation of fishery products. The bill would exclude from the fishery exemption of the Motor Carrier Law all frozen imported fishery and agricultural products and would also exclude some processed fishery products from the exempt list. This bill was reported favorably to the Senate on June 3, 1958, by the Committee on Interstate and Foreign Commerce (S. Rept. 1647). Similar bills introduced in the House: H. R. 12671 (Michel), May 23, 1958; and H. R. 12832 (Harris), June 5, 1958.

Senate passed on June 11 with amendments S. 3778, after taking the following actions on amendments: Adopted: All committee amendments en bloc, which were thereafter considered as original text for purposes of further amendment; Rejected: Beall amendment to exempt from certain economic regulation frozen fruits and vegetables. As passed the bill exempts "cooked or uncooked (including breaded) fish or shellfish, when frozen or fresh." On a question from Senator Kennedy on the Senate floor: "Is it the interpretation of the Senator from Florida that the bill attempts to exempt such frozen fisheries products as cod fish cakes, deviled crab, fish with sauce, fish dinners, and similar sea food products, even though they are shown as 'not exempt' in ICC ruling No. 107?" Senator Smathers replied: "The answer to that question is in the affirmative, 'Yes.' It was our intention that the items be exempt As best we could we made reference to these subjects in the report and in the colloquy on the floor. I am very happy to say 'Yes,' it is our understanding such products would be exempt under the provisions of the bill." As indicated in further discussion on the Senate floor seafoods which are preserved, such as canned or smoked fish, for example, are not exempt, but fresh or frozen seafoods which are perishable are exempt. Further, such items as imperial crab, crab cakes, hard shell crabs, fish with sauce or prepared for food, or fish frozen and shipped ready for serving are in the exempt status.

House Committee on Interstate and Foreign Commerce in executive session on June 12 ordered favorably reported to the House H. R. 12832 (amended), to amend the Interstate Commerce Act so as to strengthen and improve the national transportation system. (H. Rept. 1922). This bill exempts from I. C. C. regulation all fish or shellfish, and fresh or frozen products thereof containing seafood as the basic ingredient, whether breaded, cooked or otherwise prepared (but not including fish and shellfish which have been treated for preserving, such as canned, smoked, salted, pickled, spiced, corned or kippered products).

Senate Report No. 1647, Transportation Act of 1958, 85th Congress, 2nd Session, Report of the Committee on Interstate and Foreign Commerce on S. 3778 together with individual views, 37 pp., printed. As amended by the Committee, S. 3778 to amend the Interstate Commerce Act, as amended, so as to strengthen and improve the national transportation system, and for other purposes, recog-

nizes that the seafood industry is due an additional measure of relief from regulation in the transportation of some of its products under section 203 (b) (6). The amendment suggested is not intended to include within the exemption fish and shellfish which have been treated for preserving, such as canned, smoked, salted, pickled, spiced, corned, or kippered products. The committee's changes are reflected in the following:

Clause (6) of subsection (b) of section 203 of the Interstate Commerce Act, as amended, is amended by striking out the semicolon at the end thereof and inserting in lieu thereof a colon and the following:

"Provided, That the words 'property consisting of ordinary livestock, fish (including shellfish), or agricultural (including horticultural) commodities (not including manufactured products thereof)' as used herein shall include property shown as 'Exempt' in the 'Commodity List' incorporated in ruling numbered 107, March 19, 1958, Bureau of Motor Carriers, Interstate Commerce Commission, but shall not include property shown therein as 'Not exempt': Provided further, however, That notwithstanding the preceding proviso the words 'property consisting of ordinary livestock, fish (including shellfish), or agricultural (including horticultural) commodities (not including manufactured products thereof)' shall not be deemed to include frozen fruits, frozen berries, or frozen vegetables and shall be deemed to include cooked or uncooked (including breaded) fish or shellfish, when frozen or fresh."

The report contains the full Committee's adoption of the subcommittee report with amendments and discusses the changes in the subcommittee report made by the full Committee; points out that the full Committee adopted Senate Resolution 303, as recommended by the subcommittee, to provide for a study of basic long-range transportation problems in the public interest; and presents agency comments. Also gives the report of the subcommittee on surface transportation, individual views, and changes in existing law. The change effecting the exemption of certain fishery products under section 203 (b) (6) is as follows:

(6) motor vehicles used in carrying property consisting of ordinary livestock, fish (including shellfish), or agricultural (including horticultural) commodities (not including manufactured products thereof), if such motor vehicles are not used in carrying any other property, or passengers, for compensation: Provided, That the words "property consisting of ordinary livestock, fish (including shellfish), or agricultural (including horticultural) commodities (not including manufactured products thereof)" as used herein shall include property shown as "Exempt" in the "Commodity List" incorporated in ruling numbered 107, March 19, 1958, Bureau of Motor Carriers, Interstate Commerce Commission, but shall not include property shown therein as "Not exempt": Provided further, however, That notwithstanding the preceding proviso the words "property consisting of ordinary livestock, fish (including shellfish), or agricultural (including horticultural) commodities (not including manufactured products thereof)" shall not be deemed to include frozen fruits, frozen berries, or frozen vegetables and shall be deemed to include cooked or uncooked (including breaded) fish or shellfish, when frozen or fresh.

FISHERIES ASSISTANCE ACT OF 1958: House Committee on Merchant Marine and Fisheries on June 10 held hearing on H. R. 10529, and identical bills, to provide a 5-year program of assistance to enable depressed segments of the fishing industry to regain a favorable economic status.

FISHERMEN'S COOPERATIVE ASSOCIATION BANK: H. R. 12584 (Lane) introduced in the House May 20, 1958, a bill to provide credit facilities for the use of fishermen's cooperative associations through the establishment of a Bank for Fishermen's Cooperative Associations, and for other purposes; to the Committee on Merchant Marine and Fisheries (see *Commercial Fisheries Review*, June 1958, p. 82, for H. R. 2466 (Tollefson), the original bill on this subject). Both bills provide for a \$10 million revolving fund to be administered by a Board of Directors to be headed by the Secretary of the Interior.

INSECTICIDES STUDY OF EFFECT UPON FISH AND WILDLIFE: S. 2447 (Magnuson) passed by the Senate on May 29, 1958. The title of the bill was amended to read as follows: a bill to authorize and direct the Secretary of the Interior to undertake continuing studies of effects of insecticides, herbicides, and fungicides upon fish and wildlife for the purpose of preventing losses of those invaluable natural resources following application of these materials, and to provide basic data on the various chemical controls so that forests, crops, wetlands, rangelands, and other lands can be sprayed with minimum losses to fish and wildlife.

INTERIOR DEPARTMENT APPROPRIATIONS: The Conference Report (H. Rept. No. 1757) on H. R. 10746 was approved by the House on May 22 and by the Senate on May 26, 1958, and the bill was cleared for and signed by the President on June 4, 1958 (Public Law 85-439).

Public Law 85-439, 85th Congress, H. R. 10746, June 4, 1958: An Act making appropriations for the Department of the Interior and related agencies for the fiscal year ending June 30, 1959, and for other purposes. The appropriations as they apply to U. S. Fish and Wildlife Service are as follows:

FISH AND WILDLIFE SERVICE

OFFICE OF THE COMMISSIONER OF FISH AND WILDLIFE

Salaries and Expenses

For necessary expenses of the Office of the Commissioner, \$307,800.

BUREAU OF SPORT FISHERIES AND WILDLIFE

Management and Investigations of Resources

For expenses necessary for scientific and economic studies, conservation, management, investigation, protection, and utilization of sport fishery and wildlife resources, except whales, seals, and sea lions, and for the performance of other authorized functions related to such resources; operation of the industrial properties within the Crab Orchard National Wildlife Refuge (61 Stat. 770); maintenance of the herd of long-horned cattle on the Wichita Mountains Wildlife Refuge; purchase or rent of land, and functions related to wildlife management in California (16 U. S. C. 695-695c); and leasing and management of lands for the protection of the Florida Key deer; \$11,616,000; and, in addition, there are appropriated amounts equal to 12½ per centum of the proceeds covered into the Treasury during the next preceding fiscal year from the sale of sealions and other products, for management and investigations of the sport fishery and wildlife resources of Alaska, including construction.

Construction

For construction and acquisition of buildings and other facilities required in the conservation, management, investigation, protection, and utilization of sport fishery and wildlife resources, and the acquisition of lands and interests therein, \$6,929,365, to remain available until expended.

General Administrative Expenses

For expenses necessary for general administration of the Bureau of Sport Fisheries and Wildlife, including such expenses in the regional offices, \$714,100.

BUREAU OF COMMERCIAL FISHERIES

Management and Investigations of Resources

For expenses necessary for scientific and economic studies, conservation, management, investigation, protection, and utilization of commercial fishery resources, including whales, sea lions, and related aquatic plants and products; collection, compilation, and publication of information concerning such resources; promotion of education and training of fishery personnel; and the performance of other functions related thereto, as authorized by law; \$5,886,000; and, in addition, there are appropriated amounts equal to 1% per centum of the proceeds covered into the Treasury during the next preceding fiscal year from the sale of sealskins and other products, for management and investigations of the commercial fishery resources of Alaska, including construction.

Construction

For construction and acquisition of buildings and other facilities required for the conservation, management, investigation, protection, and utilization of commercial fishery resources and the acquisition of lands and interests therein, \$600,000, to remain available until expended.

Limitation on Administrative Expenses, Fisheries Loan Fund

During the current fiscal year not to exceed \$313,000 of the fisheries loan fund shall be available for expenses of administering such fund.

General Administrative Expenses

For expenses necessary for general administration of the Bureau of Commercial Fisheries, including such expenses in the regional offices, \$175,000.

Administration of Pribilof Islands

For carrying out the provisions of the Act of February 26, 1944, as amended (16 U. S. C. 631a-631g), there are appropriated amounts equal to 60 per centum of the proceeds covered into the Treasury during the next preceding fiscal year from the sale of sealskins and other products, to remain available for expenditure during the current and next succeeding fiscal years.

ADMINISTRATIVE PROVISIONS

Appropriations and funds available to the Fish and Wildlife Service shall be available for purchase of not to exceed ninety-six passenger motor vehicles for replacement only; purchase of not to exceed nine aircraft for replacement only; not to exceed \$50,000 for payment, in the discretion of the Secretary, for information or evidence concerning violations of laws administered by the Fish and Wildlife Service; publication and distribution of bulletins as authorized by law (7 U. S. C. 417); rations or commutation of rations for officers and crews of vessels at rates not to exceed \$3 per man per day; repair of damage to public roads within and adjacent to reservation areas caused by operations of the Fish and Wildlife Service; options for the purchase of land at not to exceed \$1 for each option; facilities incident to such public recreational uses on conservation areas as are not inconsistent with their primary purposes; and the maintenance and improvement of airports, buildings, and other facilities under the jurisdiction of the Fish and Wildlife Service and to which the United States has title, and which are utilized pursuant to law in connection with management and investigation of fish and wildlife resources.

(See Commercial Fisheries Review, April 1958, pp. 83-84 for other actions on H. R. 10746.)

INTERNATIONAL GEOPHYSICAL YEAR: National Science Foundation (Hearings before the Subcommittee of the Committee on Appropriations, House of Representatives, Eighty-Fifth Congress, 2nd Session, Review of the first eleven months of the International Geophysical Year), 193 pp., printed. Contains, among other reports, one on the status of the oceanography program.

LOAN FUND FOR FISHERIES: S. 3295 (Magnuson and Payne), a bill to amend the Fish and Wildlife Act of 1956 in order to increase the authorization for the fisheries loan fund established under such act. Passed by the Senate on May 29, 1958, without amendment. The bill as passed provides that subsection (c) of section 4 of the Fish and Wildlife Act of 1956 (70 Stat. 1121) is amended by striking out \$10 million and inserting \$20 million. S. 3295 is a new bill substituted for S. 2720 which was introduced in the first session of the 85th Congress (see Commercial Fisheries Review, April 1958, p. 84 and May 1958, p. 79, for additional details on S. 3295).

MARKETING FACILITIES IMPROVEMENT ACT:

S. 3883 (Humphrey) introduced in the Senate on May 22, 1958, a bill to encourage the improvement and development of marketing facilities for handling perishable agricultural commodities; to the Committee on Agriculture and Forestry. S. 3883 is a companion bill to H. R. 4504 (Cooley) introduced in the first session of the 85th Congress. Seafoods are included under the definition of perishable agricultural commodities (See Commercial Fisheries Review, April 1958, p. 79, for additional information).

SHIP MORTGAGE INSURANCE PLEDGE-OF-FAITH CLAUSE: H. R. 12739 (Bonner), a bill to amend section 1105 (b) of title XI (Federal Ship Mortgage Insurance) of the Merchant Marine Act of 1936, as amended, to implement the pledge-of-faith clause, introduced in the House on May 29; to the Committee on Merchant Marine and Fisheries.

S. 3939 (Magnuson), introduced in the Senate on June 4; S. 3919 (Magnuson), introduced in the Senate May 28; both similar to H. R. 12739 and referred to the Committee on Interstate and Foreign Commerce.

House Committee on Merchant Marine and Fisheries held hearing and also met in executive session on June 9 but took no final action on H. R. 12739 to amend title XI (Federal Ship Mortgage Insurance) of the Merchant Marine Act, 1936, to implement the pledge-of-faith clause.

SMALL BUSINESS EQUITY AND LONG-TERM CAPITAL LOANS: H. R. 12699 (Christopher) introduced in the House on May 27, 1958, a bill to make equity capital and long-term credit more readily available for small business concerns; to the Committee on Banking and Currency. Similar to nine or more bills previously introduced (See Commercial Fisheries Review, June 1958, p. 83, for other bills on this subject).

SMALL BUSINESS INVESTMENT ADMINISTRATION ACT: Senate passed on June 9 with amendment S. 3651, Small Business Investment Administration Act of 1958. Provides for a Small Business Investment Division in the Small Business Administration, small business investment companies to provide a source of needed equity capital for small business concerns, and other things. Sets up a \$250,000,000 revolving fund for the Administration to (1) purchase the subordinated debentures of small business investment companies; (2) make loans to small business investment companies; (3) make loans to State and local development companies. Reported in Senate on June 4 by the Committee on Banking and Currency (S. Rept. 1652).

Senate Report No. 1652, Small Business Investment Act of 1958 (June 4, 1958, 85th Congress, 2nd Session, Report of the Committee on Banking and Currency together with individual views to accompany S. 3651), 33 pp., printed. Contains legislative history, purpose of the bill, need for legislation, foreign experience, domestic precedents, explanation of the bill, sectional analysis of the bill, individual views of several Senators, and changes in existing law.

SMALL-BUSINESS FINANCING: Problems of Small Business Financing (Hearings before the

Select Committee on Small Business, House of Representatives, 85th Congress, 2nd Session, pursuant to H. Res. 56, a resolution creating a Select Committee to conduct a study and investigation of the problems of small business. Part II, April 16, 17, and 28, 1958, 194 pp., printed. Contains data submitted to the Select Committee by the Small Business Administration, Federal Reserve System, trade associations, consultants, and industrial economic researchers.

STARFISH ERADICATION EMERGENCY PROGRAM: H. R. 12554 (Fogarty) introduced in the House on May 19, 1958, a bill to provide that the Secretary of the Interior shall develop and carry out an emergency program for the eradication of starfish in Long Island Sound and adjacent waters; to the Committee on Merchant Marine and Fisheries; also, H. R. 12666 (Forand) introduced in House on May 23, 1958. Both bills are similar to three other House bills and one Senate bill previously introduced (see Commercial Fisheries Review, June 1958, p. 83, for additional information on these bills).

STATE DEPARTMENT APPROPRIATIONS: H. R. 12428 (Rooney), a bill making appropriations for the Departments of State, Justice, and Judiciary, and related agencies for the fiscal year ending June 30, 1959, and for other purposes. Passed the House on May 15, 1958. The bill as passed includes the sum of \$1,644,900 for the use of International Fisheries Commissions. This is \$15,100 below the budget estimate and \$35,100 below the amount appropriated for fiscal year 1958. The appropriations as approved by the House for International Fisheries Commissions are as follows: International Pacific Halibut Commission, \$111,000; International Pacific Salmon Fisheries Commission, \$233,000; Inter-American Tropical Tuna Commission, \$363,000; International Commission for the Northwest Atlantic Fisheries, \$5,250; International Whaling Commission, \$600; International North Pacific Fisheries Commission, \$17,650; Great Lakes Fishery Commission, \$900,000; and Expenses of U. S. Commissioners, \$14,400.

Senate Committee on Appropriations in executive session on June 9 ordered favorably reported with amendments, H. R. 12428, fiscal 1959 appropriations for the Departments of State and Justice, and the Judiciary. Includes funds for international fisheries commissions. Passed by the Senate June 11 and sent to conference. For the international fisheries commissions the Senate approved the same funds previously approved by the House (See Commercial Fisheries Review, June 1958, pp. 83-84 for further details on H. R. 12428).

Departments of State, Justice, the Judiciary, and Related Agencies Appropriations, 1959 (Hearings before the Subcommittee of the Committee on Appropriations, United States Senate, Eighty-Fifth Congress, 2nd Session, on H. R. 12428, making appropriations for the Departments of State and Justice, the Judiciary, and related agencies for the fiscal year ending June 30, 1959), 804 pp., printed. Contains the statements, testimony, and other facts regarding the appropriations to the Departments mentioned, including funds for the International Fisheries Commissions.

TRADE AGREEMENTS ACT EXTENSION: Bills to extend the authority of the President to enter

into trade agreements under section 350 of the Tariff Act of 1930, as amended, and for other purposes; and all referred to the House Committee on Ways and Means. In addition to the 14 or more bills previously announced (see Commercial Fisheries Review, March 1958, p. 65, April 1958, p. 84, and May 1958, p. 79), the following bills have been introduced: May 14, 1958: H. R. 12522 (Moore), H. R. 12562 (Withrow), H. R. 12529 (Henderson), H. R. 12530 (Mack of Washington), H. R. 12532 (Utt); May 15, 1958: H. R. 12546 (Cederburg), H. R. 12553 (Berry); May 21: H. R. 12591 (Mills) and H. R. 12610 (Fisher); May 26, 1958: H. R. 12676 (Simpson), H. R. 12680 (Dorn of S. C.), H. R. 12683 (Bailey), H. R. 12686 (Davis of Georgia), and H. R. 12688 (Moore). May 27, 1958: H. R. 12703 (Henderson). The various bills would extend the President's authority to enter into trade agreements for periods ranging from one to five years. The only bills which were debated or the subject of hearings were H. R. 10368 (Mills) which was the original bill that included the Administration's recommendations and the subject of extensive hearings, and H. R. 10591 (Mills) a substitute bill for H. R. 10368. As a result of the objections raised to H. R. 10368, the House Ways and Means Committee introduced a "clean bill" H. R. 12591 (Mills). This bill (introduced on May 21, 1958) was reported (H. Rept. No. 1761) on same day. On June 9, the House adopted H. Res. 578, closed rule with eight hours of debate for consideration of H. R. 12591. This bill was passed, with amendments, on June 11, 1958, by the House and sent to the Senate. In course of the passage of the bill in the House, a substitute bill, H. R. 12676 (Simpson) was rejected. H. R. 12591 as passed by the House would provide for the following: Extend the authority of the President to enter into reciprocal trade agreements for five years--to June 30, 1963. Pursuant to such agreements the President would be able to reduce tariff rates existing on July 1, 1958 as follows: (a) by 25 percent, with no yearly reduction exceeding 10 percent of the duty rate; (b) by 2 percentage points ad valorem, without any yearly reduction exceeding 1 percentage point; or (c) to 50 percent ad valorem if an existing rate of duty is in excess of that amount, with no more than one-third of the total reduction occurring in any one year. With the approval of the Administration, the Committee recommended nine provisions that are designed to restrict the President's authority in the trade agreements program. Chief of these would amend the "escape clause" procedure to provide that in cases in which the President has disapproved the recommendations of the Tariff Commission for tariff relief for a domestic industry, the President's action may be overturned by a two-thirds vote of both houses of Congress in a concurrent resolution. Other restrictive amendments would: (a) increase the time for "peril point" investigations, which precede trade agreement negotiations, from 120 days to six months; (b) decrease the time in which the Tariff Commission must conclude escape clause investigations from nine months to six months; (c) authorize the Tariff Commission to recommend and the President to impose a rate of duty on an item on the free list which has been bound in a trade agreement; and (d) make it possible for organizations or groups of employees to file an application for escape clause investigation.

House Document No. 384, Second Annual Report on the Trade Agreements Program (May 19, 1958,

85th Congress, 2nd Session, Message from the President of the United States transmitting the Second Annual Report on the operation of the Trade Agreements Program, pursuant to Section 350 (3) (i) of the Tariff Act of 1930 as amended by Section 3 (d) of the Trade Agreements Extension Act of 1955, referred to the Committee on Ways and Means, 55 pp., printed. Discusses general trade policy developments, United States foreign trade during 1957, special trade policy developments, the Trade Agreements Program and regional integration, and the administration of the program. Appendix A reports on the relaxation of quantitative restrictions against imports from the dollar area, and Appendix B is the report to the Secretary of State by the Chairman of the United States Delegation to the Twelfth Session of the General Agreement on Tariffs and Trade.

H. Rept. No. 1761, Trade Agreements Extension Act of 1958 (Report of the Committee on Ways and Means, House of Representatives, 85th Congress, 2nd Session, to accompany H. R. 12591, a bill to extend the authority of the President to enter into trade agreements under section 350 of the Tariff Act of 1930, as amended and for other purposes), 135 pp., printed. Report gives principal features of H. R. 12591, an explanation of the provisions of the bill, and the history of the legislation. Also, a review of the need for extension of the President's authority to enter into trade agreements, a section-

by-section explanation of the bill, changes in existing law, minority views, and two appendixes.

UNEMPLOYMENT RELIEF IN DEPRESSED AREAS: S. 3683 (Douglas and others), a bill to establish an effective program to alleviate conditions of substantial and persistent unemployment and underemployment in certain economically depressed areas. Passed the Senate on May 13, 1958, without amendment. Bill provides for setting up an Area Redevelopment Administration under the Housing and Home Agency. The new agency would be headed by a Commissioner with an advisory board of 11 members from other government agencies. Any area in the United States with 6 to 15 percent unemployment for periods ranging 6 months to 24 months would be eligible for redevelopment aid. A sum not to exceed \$300 million would be used to carry out the purposes of Act and \$4.5 million is set aside for technical assistance to depressed areas (See *Commercial Fisheries Review*, June 1958, p. 84, for additional bills on this subject).

VESSEL PERSONNEL MEDICAL CARE: S. 3724 (Magnuson) introduced in the Senate on April 29, a bill to provide medical care of certain persons engaged on board a vessel in the care, preservation, or navigation of such vessel. Would also cover self-employed fishermen which are not now included in Section 2 (h) of the Public Health Service Act 42 U. S. C., sec. 201 (h)).



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FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES
In Millions of Pounds

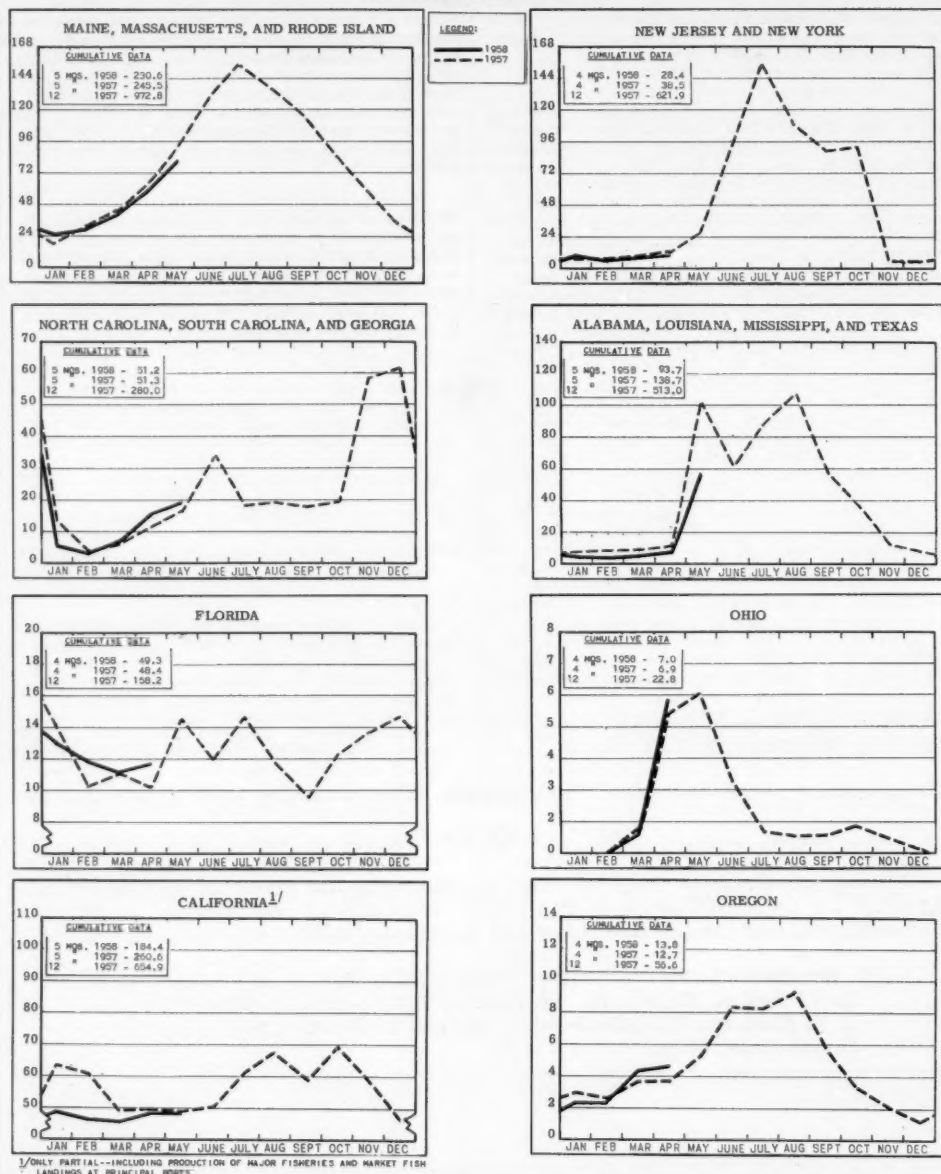
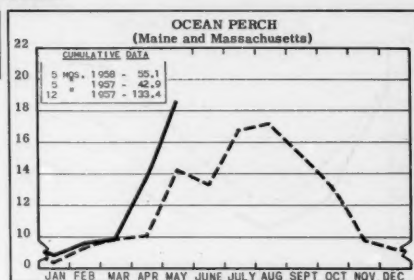
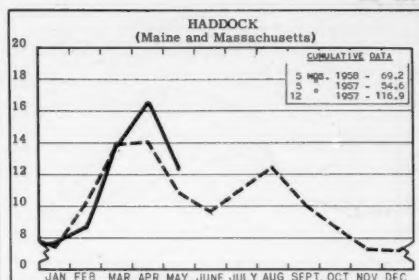
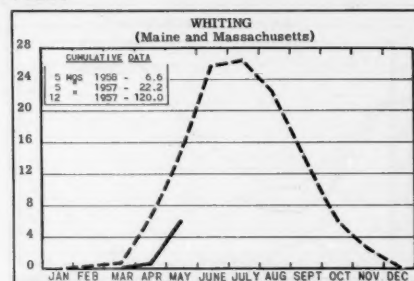
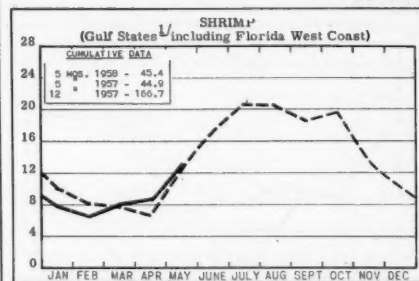


CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

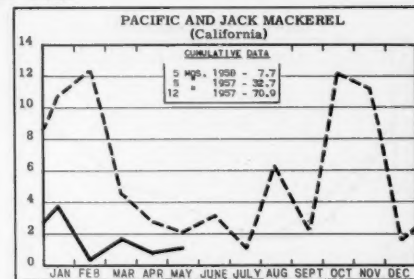
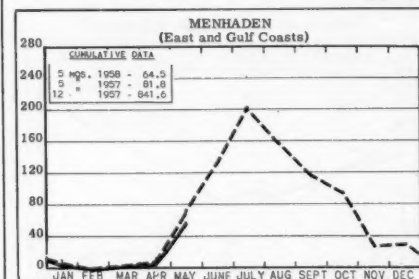


In Millions of Pounds



^{1/}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

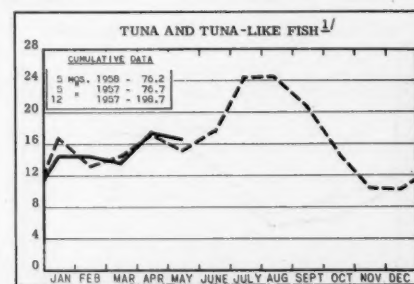
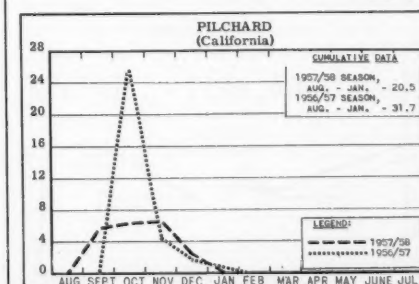
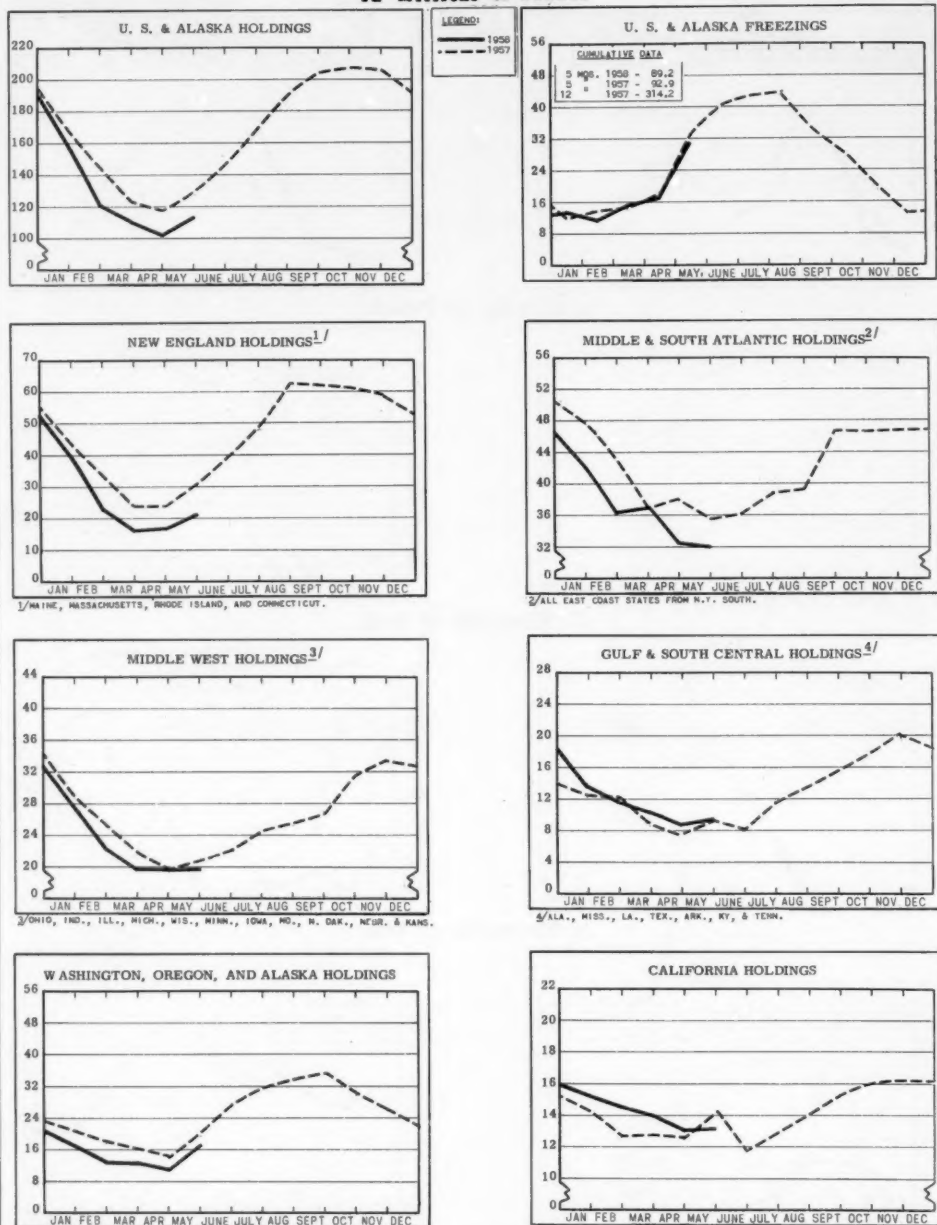


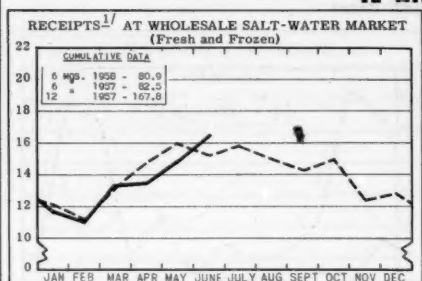
CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds



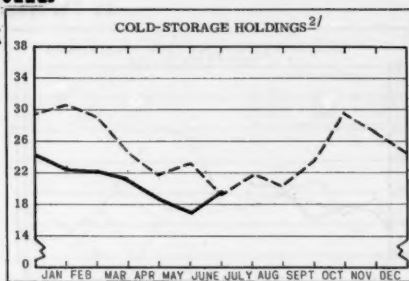
* Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS
In Millions of Pounds

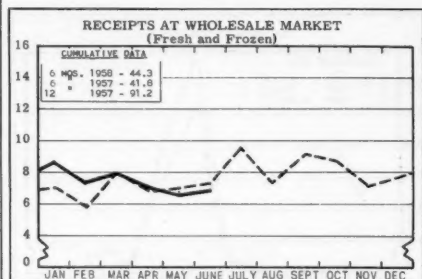


^{1/}INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

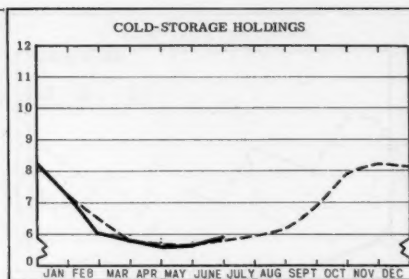
NEW YORK CITY



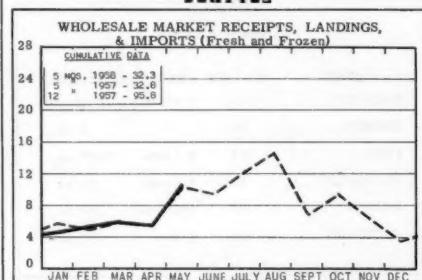
^{2/}AS REPORTED BY PLANTS IN METROPOLITAN AREA.



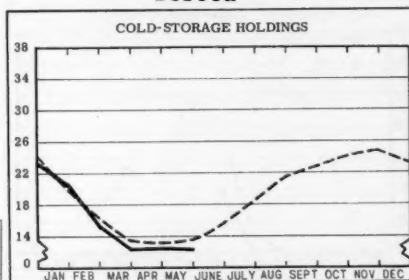
CHICAGO



SEATTLE



BOSTON



LEGEND:

— 1956
- - - 1957

CHART 5 - FISH MEAL and OIL PRODUCTION - U.S. and ALASKA

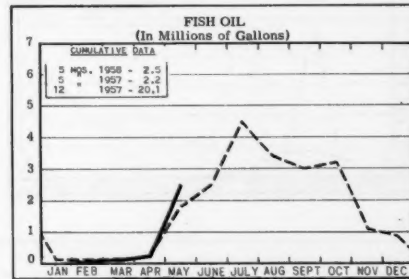
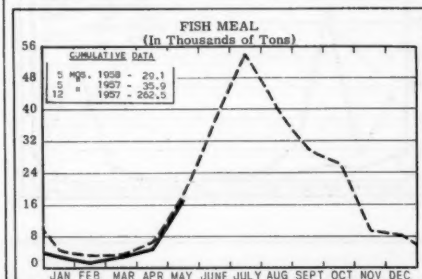
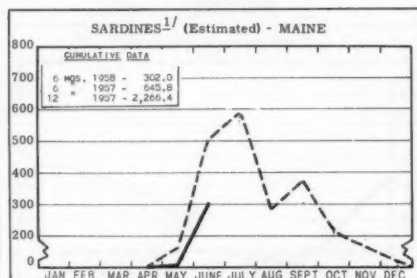
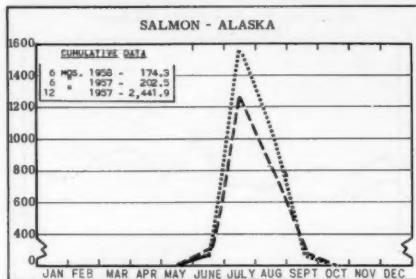
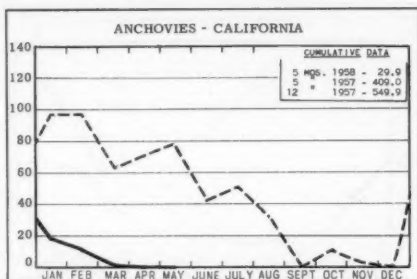
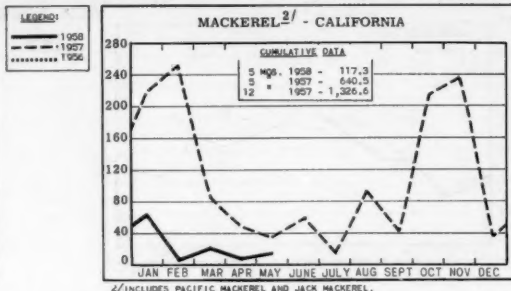
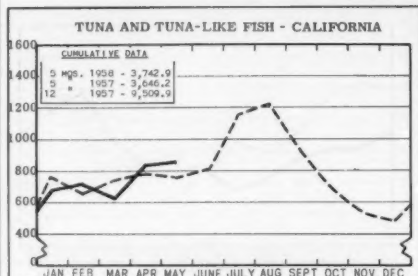


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	$\frac{1}{2}$ drawn	3 $\frac{1}{2}$ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# $\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	$\frac{1}{2}$ -lb.	8 oz.

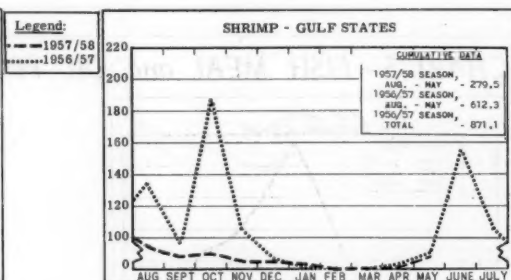
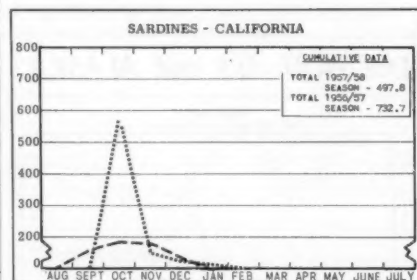
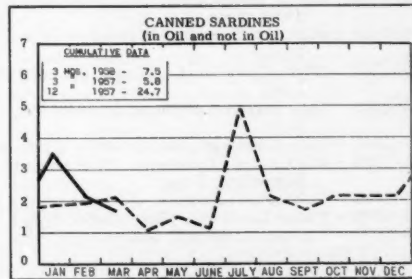
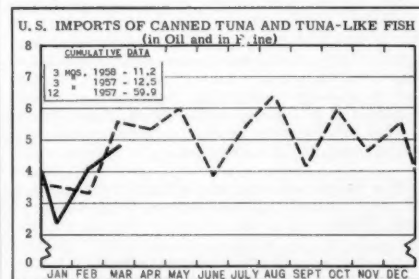
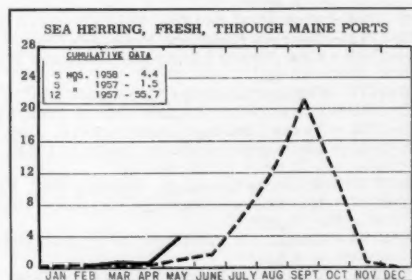
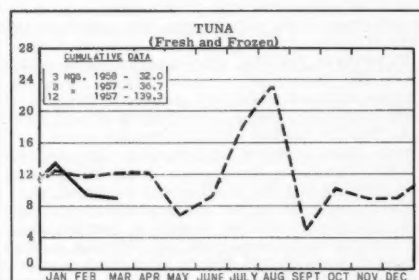
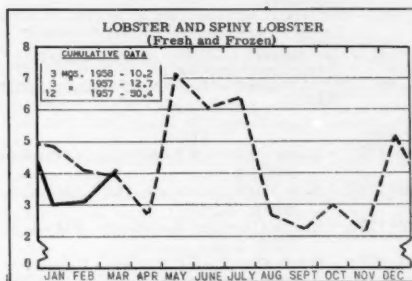
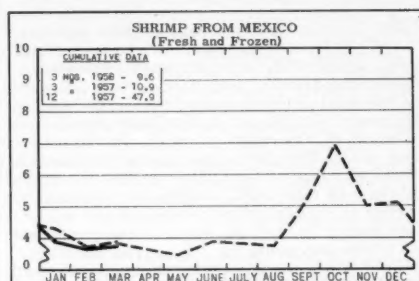
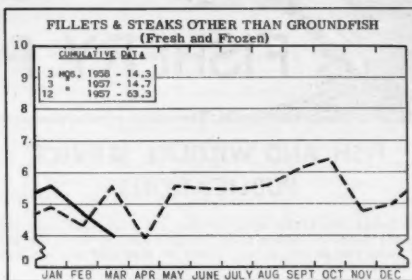
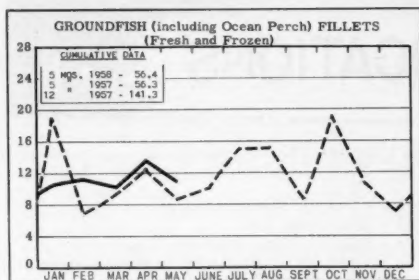
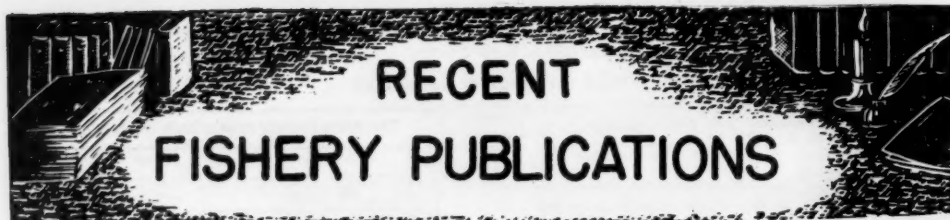


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds





RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

- CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
- SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
- FL - FISHERY LEAFLETS.
- SSR - FISH-SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
- SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number	Title
CFS-1757	- Massachusetts Landings, November 1957, 5 pp.
CFS-1764	- New York Landings, 1957 Annual Summary, 8 pp.
CFS-1770	- North Carolina Landings, February 1958, 3 pp.
CFS-1771	- South Carolina Landings, February 1958, 2 pp.
CFS-1772	- Mississippi Landings, January 1958, 2 pp.
CFS-1774	- Fish Meal and Oil, February 1958, 2 pp.
CFS-1775	- Georgia Landings, February 1958, 2 pp.
CFS-1776	- New Jersey Landings, February 1958, 3 pp.
CFS-1777	- Shrimp Landings, December 1957, 6 pp.
CFS-1778	- Frozen Fish Report, March 1958, 8 pp.
CFS-1780	- Texas Landings, January 1958, 3 pp.
CFS-1781	- Louisiana Landings, January 1958, 2 pp.
CFS-1783	- Alabama Landings, January 1958, 2 pp.
CFS-1787	- Mississippi Landings, February 1958, 2 pp.
CFS-1788	- California Landings, December 1957, 4 pp.
CFS-1789	- Fish Stick Report, January-March 1958, 2 pp.
CFS-1790	- Rhode Island Landings, February 1958, 3 pp.
CFS-1792	- Alabama Landings, February 1958, 2 pp.
CFS-1797	- North Carolina Landings, March 1958, 3 pp.
CFS-1800	- New Jersey Landings, March 1958, 3 pp.
CFS-1801	- Ohio Landings, March 1958, 2 pp.
CFS-1802	- Mississippi Landings, 1957 Annual Summary, 3 pp.
CFS-1803	- California Landings, January 1958, 4 pp.
CFS-1805	- Maine Landings, March 1958, 3 pp.
CFS-1809	- Florida Landings, March 1958, 6 pp.

Firms Canning, 1957 (Revised):

- SL-102 - Maine Sardines (including sea herring), 2 pp.
- SL-102A - Pacific Sardines, 1 p.
- SL-104 - Mackerel, 1 p.
- SL-108 - Salmon Eggs for Bait, 1 p.
- SL-116 - Food for Animals from Marine Animal Products, 2 pp.
- SL-120 - Anchovies, 1 p.

FL - 393 - Fisheries of the United States and Alaska, 1957 (A Preliminary Review), by E. A. Power, 42 pp., April 1958. A preliminary review of commercial fishery activities in 1957. Reports that the total catch of United States and Alaska fishermen in 1957 was 4.75 billion pounds, a decrease of 10.5 percent as compared with the previous year. The 1957 catch had a total estimated ex-vessel value of about \$351 million--about \$18 million less than 1956, despite the fact that the average ex-vessel price per pound for the 1957 catch increased to 7.39 cents as compared with 7.03 cents per pound for 1956. The decline of the 1957 catch resulted from decreases in both edible and industrial fish catches. The total 1957 catch of industrial fish was 2.23 billion pounds as compared with 2.58 billion pounds for the previous year. Menhaden, the principal industrial species, decreased 400 million pounds or 20 percent in 1957. The total catch of edible fish in 1957 amounted to 2.52 billion pounds as compared with 2.67 billion pounds in 1956. There were decreases in the catch of cod, haddock, Pacific halibut, Atlantic ocean perch, salmon, tuna, oysters, and shrimp. Record increases, however, were made in the Dungeness crab harvest and the whiting catch. Small increases occurred in the catch of herring, flounders, mackerel, pollock, scallops, and lobsters. The fishing boats employed 142,000 men in 1957 as compared with 144,000 in 1956. Employment in shore establishments was estimated at 100,000. The number of boats used totaled approximately 84,000. Of the total catch, 30 percent or 1.4 billion pounds was sold as fresh or frozen fish, 24 percent was canned, and 2 percent was cured. Byproducts--oil and meal--accounted for 2.1 billion pounds or 44 percent of the catch. In addition to data on production, processing, prices, and supplies of the domestic catch, this leaflet contains information on the fishery imports and exports, and world fisheries.

FL - 449 - Organizations and Officials Concerned with the Commercial Fisheries, 1958, 13 pp., March 1958.

SSR-Fish. No. 236 - Downstream Movement of Salmonids at Bonneville Dam, by Joseph E. Gauley, Raymond E. Anas, and Lewis C. Schlotterbeck, 16 pp., illus., January 1958.

SSR-Fish. No. 237 - Food of Salmonid Fishes of the Western North Pacific Ocean, by George H. Allen and William Aron, 15 pp., illus., January 1958.

SSR-Fish. No. 241 - Hull Insurance and Protection and Indemnity Insurance of Commercial Fishing Vessels, by Warner C. Danforth and Dr. Chris A. Theodore, 348 pp., December 1957. The problems of the commercial fishing industry with marine insurance are complicated and controversial. There have been complaints from the fishing industry, particularly in New England, that the cost of insurance has risen substantially. On the other hand, many insurance firms have withdrawn from the field because of disastrous loss experience. This survey is an inquiry into the situations, forces, conditions, and factors which have given rise to the hull and protection and indemnity insurance problem in the New England, Gulf of Mexico, and California areas. On the basis of the information assembled, a number of conclusions are made which throw light on the fishing industry's insurance problems. The report consists of two parts each in a separate publication. A summary of conclusions and recommendations, an extensive discussion of the insurance problem and two appendices which contain the basic tables and a summary of sampling techniques are included in this publication. A supplement contains a description of accidents, the owner's reasons for insurance coverage, and his occupational activities together with comments made by the interviewed vessel owners on the hull and protection and indemnity insurance problems.

SSR-Fish. No. 251 - Sardine Eggs and Larvae and Other Fish Larvae, Pacific Coast, 1956, by Elbert H. Ahlstrom, 90 pp., illus., January 1958.

SSR-Fish. No. 253 - Sodium Cyanide as a Fish Poison, by W. R. Bridges, 16 pp., February 1958.

SSR-Fish. No. 254 - Foreign Shrimp Fisheries (Other than Central and South America), 75 pp., illus., March 1958. The growth of the domestic shrimp industry since World War II and a growing interest in sources of supplies have created a demand for detailed information regarding the shrimp fisheries of foreign countries. This report discusses the shrimp fisheries of Canada and Greenland, the Caribbean area, Europe, North Africa and the Near East, Asia, Australia, and Oceania. The report states that "The largest foreign shrimp fisheries are in Asia. Here, millions of fishermen, using primitive methods for the most part, fish for shrimp and other species of fish and shellfish. The individual fisherman's daily catch is often poor by Western standards, although the aggregate catch may be very large. A modest start has been made in recent years to modernize shrimp fishing and processing methods in some Far Eastern countries, notably in Pakistan and India. European waters support long-established and important shrimp fisheries. In general, the shrimp are small and catches are sufficient only for Euro-

pean markets. Except for the Mediterranean area, no information has been assembled about shrimp fisheries for African countries. For most African nations, however, the shrimp fisheries are unimportant."

Sep. No. 511 - Damariscotta (Maine) Alewife Fishery.

Sep. No. 512 - The Blue Crab and its Fishery in Chesapeake Bay: Part I - Reproduction, Early Development, Growth, and Migration.

Sep. No. 513 - Research in Service Laboratories (June 1958): Contains these articles--"Frozen Packaged Halibut Voluntary Standards Discussed at Meeting;" "Progress in Fish-Oil Research;" "Report on Development of Fungicides from Fish Oil;" and "Technical Note No. 44 - Industry Tests Show Brine-Frozen Haddock to be of Good Quality."

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED IN THE REVIEW.

California Fishery Products Monthly Summary, March 1958, 11 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of raw tuna and tunalike fish, herring, mackerel, anchovies, and squid; pack of canned tuna, herring, mackerel, anchovies, and squid; market fish receipts at San Pedro, San Monica, San Diego, and Eureka areas; California imports; canned fish and frozen shrimp prices; trends in the California fisheries; ex-vessel prices for cannery fish; American Tuna Boat Association tuna auction sales; for the month indicated.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, April 1958, 12 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces; fresh-water fish, shrimp, and frozen fillet wholesale market prices; fisheries trends at Chicago; for the month indicated.

Gulf Monthly Landings, Production, and Shipments of Fishery Products, April 1958, 5 pp. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; and wholesale prices of fish and shellfish on the New Orleans French Market; for the month indicated.

Monthly Summary of Fishery Products in Selected Areas of Virginia, North Carolina, and Maryland, April 1958, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Ocean City, and Cambridge; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

New England Fisheries--Monthly Summary, April 1958, 21 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New

England fishery ports, and presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the month indicated.

(New York) Monthly Summary - Receipts of Fishery Products at the New York City Wholesale Salt-Water Market, March 1958, 15 pp.; April 1958, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Receipts in the salt-water section of the Fulton Fish Market by species and by states and provinces; for the months indicated.

(Seattle) Monthly Summary - Fishery Products, February 1958; March 1958; 4 pp. each. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria (Ore.) wholesale dealers; also Northwest Pacific halibut landings; for the months indicated.

Receipts and Prices of Fresh and Frozen Fishery Products at Chicago, 1957, by G. A. Albano, 60 pp., processed, May 1958. (Available free from the Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) In the first part of this report, the author presents an analysis of receipts of fishery products at Chicago, and discusses sources of receipts, methods of transportation, receipts by months, receipts by species and varieties, lake trout and whitefish fishery and receipts, U. S. imports of frozen fillets, U. S. imports of fresh and frozen fresh-water fish from Canada, cold-storage inventories, and trends and developments in 1957. Also included is a table giving the names, classifications, and approximate weights of certain fishery products as used in the Chicago wholesale markets. The second section presents statistical data on fresh and frozen fishery products receipts at Chicago by species and by states and provinces of origin, states and provinces by species, species by months, states and provinces by months, totals by species, and totals by states and provinces. Receipts are tabulated by method of transportation (truck, express, and freight). A table shows the monthly range of wholesale prices of some of the leading varieties of fresh and frozen fishery products handled in the Chicago market.

Sodium and Potassium Content of 34 Species of Fish, by Claude E. Thurston, 4 pp., printed. (Reprinted from Journal of the American Dietetic Association, vol. 34, no. 4, April 1958.)

Fishery Technological Laboratory, Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service, Seattle, Wash. The objective of the work reported in this paper was to determine the content of sodium in as wide a variety as possible of the principal species of fresh- and salt-water fish. Potassium values were included for comparative purposes because considerable attention now is being directed to the sodium-potassium balance. The collection and preparation of samples, experimental procedure, and results of the study are discussed. Thirty-four species of fresh- and salt-water fish were analyzed for sodium and potassium content. Sodium content of the individual species of salt-water fish ranged from 35 to 96 mg. per 100 gm. fish and averaged 68 mg. That for individual species of fresh-water fish ranged from 48 to 84 mg. per 100 gm. fish with an average of 56 mg. Large differences were noted in the sodium values for similar species from various geographic areas. Albacore tuna and Lake Huron herring had the lowest content of sodium of the species analyzed. Even the species having the highest individual sodium values would be well suited for inclusion in low-sodium diets, since no specimens contained as much as 100 mg. sodium per 100 gm. fish. The ratio of the sodium content to that of potassium was quite similar in both the fresh- and salt-water fish, being approximately one part by weight of sodium to five parts by weight of potassium.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

High-Speed Plankton Sampler, by Elbert H. Ahlstrom, John D. Isaacs, James R. Thrailkill, and Lewis W. Kidd, Fishery Bulletin 132 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 58), 31 pp., illus., printed, 50 cents, 1958.

Factors Causing Decline in Sockeye Salmon of Karluk River, Alaska, by George A. Rounsefell, Fishery Bulletin 130 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 58), 90 pp., illus., printed, 55 cents, 1958.

Laws and Regulations for Protection of the Commercial Fisheries of Alaska, 1958, Regulatory Announcement 56, 38 pp., printed, March 1958, 25 cents. This publication is divided into two sections. One section contains laws for the protection of the commercial fisheries of Alaska and related information, including the authority for regulation, rules regarding oyster culture, Bristol Bay residence requirements, regulation of salmon escapement, fishing-gear restrictions, exceptions to weekly closed seasons, etc. The second section contains all the regulations governing the commercial fisheries in Alaska. These 1958 regulations supersede the regulations published in Regulatory Announcement 51 which became effective April 5, 1957. They have been recodified, and as a result they contain many minor changes as well as the seasonal changes for 1958.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ADVERTISING:

White Fish Authority Publicity Campaign, 1958/59, 8 pp., illus., processed. White Fish Authority, Tilbury House, Petty France, London, England. A brief description of the forthcoming advertising campaign planned by the United Kingdom's White Fish Authority to promote the "fishmonger" and the "man in the fried fish shop." Includes six samples of the advertisements that will be used in 75 evening newspapers in England, Scotland, Wales, and North Ireland.

AUSTRALIA:

Australian Journal of Marine and Freshwater Research, vol. 9, no. 1, March 1958, 158 pp., illus., printed. Commonwealth Scientific and Industrial Research Organization, 314 Albert St., East Melbourne, C. 2, Victoria, Australia. Contains, among others, the following articles: "Observations on the Biology of the Greentail Prawn, *Metapenaeus mastersii* (Haswell)"--Crustacea Decapoda: Penaeidae, by W. Dall; and "Reproduction in Australian Pearl Oysters (*Lamellibranchia*)--Part I, *Pinctada albina* (Lamarck): Primary Gonad Development and Part II, *Pinctada albina* (Lamarck): Gametogenesis," by D. J. Tranter.

CANADA:

Analyse Comptable des Activités des Pêcheurs Côtiers, Gaspésie, Québec, 1949-1953 (Statistical Analysis of the Activities of the Coastal Fisheries, Gaspésie, Québec, 1949-1953), by John Proskie and R. G. Gosselin, Étude sur l'Industrie Primaire, vol. 1, no. 3, 35 pp., illus., printed in French. Ministère des Pêcheries du Canada, Ottawa, Canada, 1958.

"Canadian Fish Finds Worldwide Markets," by T. R. Kinsella, article, Foreign Trade, vol. 107, no. 8, April 13, 1957, pp. 2-5, illus., printed, single copy 20 Canadian cents. The Queen's Printer, Government Printing Bureau, Hull, Canada. Details are given on the production and export of fishery products in Canada during 1956. Sales of Canadian fish to foreign countries during 1956 reached a record C\$133.7 million, despite a small salmon pack and drop in salt-fish shipments. The pattern of distribution followed the usual trend, with the United States taking about half of the output. Fresh and frozen fish was Canada's leading seller, reaching a value of C\$78 million; lobster shipments totaled over C\$20.5 million.

Fisheries Statistics of Canada (Nova Scotia), 1956, 93 pp., printed in French and English, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1958. Consists of tables giving the value of fish and shellfish landed in Nova Scotia, 1949-1956, by species; the quantity and value by species and fisheries districts of landings and fishery products, 1955-56; and capital equipment employed and number

of persons engaged in the primary operations by fisheries districts, 1955-56.

Progress Reports of the Pacific Coast Stations, no. 110, 20 pp., illus., printed. Fisheries Research Board of Canada, Technological Station, 898 Richards St., Vancouver 2, B. C., Canada, April 1958. Contains, among others, the following articles: "Dogfish," by H. L. A. Tarr; and "Some Recent Experiments on Preservation of Fish with Tetracycline Antibiotics," by B. A. Southcott, R. Moyer, E. G. Baker, and H. L. A. Tarr.

Summary of Fisheries Statistics of British Columbia, 1957 (Preliminary), 13 pp., processed. Canadian Department of Fisheries, Vancouver, Canada, April 8, 1958. A preliminary review of fisheries statistics for British Columbia for 1957, presenting the total value of fish and by-products, and fishery trends. Statistical tables cover the marketing of salmon by species; landed and marketed value of salmon by method of process, and by species; production and utilization of salmon by species; canned salmon pack by species; total herring landed and marketed and byproducts; halibut landed and marketed; crab and shrimp landings; landings and value of all products marketed of the most important species; landed and marketed value of fish and fish products; landings and manufactured products marketed; summary of liver and viscera production; salmon pack by area where canned; inventories of vessels, and gear and equipment used in primary fishery; and the number of fishermen licensed in British Columbia.

COD:

"The Omnivorous Codfish," by Bernard L. Gordon, article, Nature Magazine, vol. 51, no. 4, April 1958, pp. 205-207, illus., printed, single copy 50 cents. American Nature Association, 1214 16th St. NW., Washington 6, D. C. The cod was an important item in the economy of the United States and Canada in earlier days, and although there has been a marked decrease in the cod population on the Grand Banks, millions of pounds of cod still are landed annually. This article tells where the cod fishery is located, and describes briefly the life history of the cod past and present methods of capture, and methods of preservation.

COMMISSIONS:

Sixteenth Annual Report of the Atlantic States Marine Fisheries Commission (to the Congress of the United States and to the Governors and Legislators of the Fifteen Compacting States), 79 pp., printed. Atlantic States Marine Fisheries Commission, 22 West First St., Mount Vernon, N. Y., April 1958. Includes a report on the state of the Commission and development of the new committee system. Contains reports on the following sections: North Atlantic--covering quality controls and research on clams, Connecticut River shad, striped bass, and bluefish; Middle Atlantic--presenting the results of investigations of marshlands and estuarine waters, dams on the Delaware River, and grey sea trout (weakfish); Chesapeake Bay--including reports on the conflicts of Virginia and Maryland over the Potomac River fisheries, blue crab research, and industrial pollution; and South Atlantic--covering differences in shrimp

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fishing privileges, exploratory fishing, reorganization of the U. S. Fish and Wildlife Service, and Tortugas shrimp fishing problems. Appendices cover, among other items, state legislation needed, reports on the technological and biological sections, summaries of clam and shad investigations, and results of the striped bass program.

CRABS:

"Life-History and Biology of the Oyster Crab, *Pinnotherea ostreum*, Say," by Aage Möller Christensen and John J. McDermott, article, *The Biological Bulletin*, vol. 114, no. 2, April 1958, pp. 146-179, illus., printed, single copy \$2.50. *The Biological Bulletin*, Marine Biological Laboratory, Woods Hole, Mass.

Notes on a Non-Commercial Crab of the Genus *Callinectes* in Trawl Catches in South Carolina, by G. Robert Lunz, Contributions from Bears Bluff Laboratories No. 27, 17 pp., illus., printed. Bears Bluff Laboratories, Wadmalaw Island, S. C., May 1958. The results of a study concerning the noncommercial crab of the *Callinectes* family which is abundant in trawl catches in South Carolina. The author states that "Regardless of what species this small noncommercial crab turns out to be, the questions posed by its abundance probably are the same, for it is a small crab which only seldom reaches the legal marketable length in South Carolina." This report describes the spawning; sex ratio; and temperature, salinity, and depth preference of the noncommercial *Callinectes*. The author states that "The abundance of this noncommercial crab has presented a management problem."

DENMARK:

Årsberetning fra Fiskeriministeriets Forsøgslaboratorium for 1957 (Annual Report to the Danish Fishing Industry for 1957), 44 pp., illus., printed in Danish with English translation of the main experimental results. Fiskeriministeriets Forsøgslaboratorium, Copenhagen, Denmark, 1958. Describes the results of the following experiments: oil in herring and sand eels; food value of fish for animal feeding; chilling of fish; antibiotics as a means for preserving fish; preservation with aureomycin ice; freezing fish and shellfish, such as trout, mackerel fillets, Norwegian lobster, and sauces; smoked fish; semi-preserved caviar; canned cod roe; aluminum cans; fish meal; and fish silage.

DIRECTORIES:

A Directory of White Fish Exporters in the United Kingdom, 28 pp., printed. White Fish Authority, Tilbury House, Petty France, London SW1, England, March 1958. A directory of white fish exporters containing a list of fish names in English, French, German, and Spanish; a table of weights as quoted in the directory; classification of exporters by varieties sold and by ports or other centers of distribution; and lists of brand names and trade associations. A Code of Practice for the freezing of fish, dealing with the processing, packing, storage, and sale of quick-frozen fish, is included as an appendix. The firms that comply with the Code are indicated in the directory.

EAST AFRICA:

East African Fisheries Research Organization, 1956/1957, 47 pp., printed. East African Fisheries Research Organization, P. O. Box 343, Jinja, Uganda, 1958. This report covers the period from July 1956 to December 1957, and contains a general account of the scientific work of the Organization, including fishery biology and growth studies. Reports on the following investigations are included: growth rate of *Tilapia* and *Mormyrus* in Lake Victoria; and the food of young *Tilapia*, *Protopterus*, *Clarias*, and *Mormyrus*. Includes, among others, a paper entitled "On the Growth of *Tilapia esculenta* (Graham)," by D. J. Garrod.

FLORIDA:

Check List of the Florida Game and Commercial Marine Fishes (Including Those of the Gulf of Mexico and the West Indies, with Approved Common Names), by C. Richard Robins, Educational Series No. 12, 46 pp., printed. State Board of Conservation, Tallahassee, Fla., March 1958. This is a check list of the game and commercial marine fish of Florida and the West Indies with a standardization of common names. Some of the reasons are given for the application of different names to a single species of fish. Thus, the basis for the selection of many of the names used in this list may be better understood. A selected bibliography of books on the identification of Florida fish is also included.

FOOD AND AGRICULTURE ORGANIZATION:

The Economics of Fisheries, edited by Ralph Turvey and Jack Wiseman, 248 pp., illus., printed. Food and Agriculture Organization of the United Nations, Rome, Italy, 1957. Proceedings of a Round Table organized by the International Economic Association and held in Rome in September 1956, sponsored by the Food and Agriculture Organization of the United Nations. The problems examined in the background papers of this Round Table and discussions cover only some of the economic aspects of fisheries and fish marketing. Two papers consider cost conditions in fishing, one with particular reference to wages. The problem of fishery regulation is treated in no less than three papers, one of which refers to a particular case—the North Sea. Marketing is the subject of two papers, both marketing at the port and distribution inland being examined. In addition, there is a discussion of many of the same problems with particular reference to poor countries. Lastly the problems of Iceland's fisheries are considered. The following papers and discussions are included: "A Note on Costs in Fisheries," by G. M. Gerhardsen; "Fishermen's Remuneration," by H. Zoetewij; "Optimal Utilization and the Control of Fisheries," by Anthony Scott; "Obstacles to Agreement on Control in the Fishing Industry," by H. Scott Gordon; "Special Problems of Fisheries in Poor Countries," by E. S. Kirby and E. F. Szczepanik; "The Control of North Sea Fisheries," by G. Lienesch; "Port Markets," by Ian Bowen; "The Marketing of Fishery Products in the U. S. A.," by Ralph Cassidy, Jr., and "Fish Marketing in Iceland with Special Reference to Foreign Trade," by Olafur Björnsson.

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FRANCE:

Poissons de Mer Frais (Fresh Salt-Water Fish), 105 pp., illus., in color, printed in French. Direction Generale des Prix et des Enquetes Economiques, 41, Quai Branly, Paris VII, France. (Comite National de Propagande Pour La Consommation du Poisson, 11 Rue Anatole-de-la-Forge, Paris XVII.) A guide for the identification of the principal salt-water fish consumed in France, containing colored plates of each species. Includes a list of characteristics for determining the extent of freshness of salt-water fish. Also presents a list of the common fish names in French, German, English, Danish, Dutch, Norwegian, and Swedish, with corresponding scientific names.

FUNGI:

Literature on Halophilous and Halolimnic Fungi, by T. W. Johnson, Jr., and Samuel P. Meyers, Contribution No. 190, 30 pp., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 7, no. 4, pp. 330-359, December 1957.) The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla. A bibliography of references to publications on marine and brackish-water fungi, together with annotations on some articles, is presented. The references are world-wide in scope, and include all phases of marine mycology.

GENERAL:

Federal Aid in Fish and Wildlife Restoration (Annual Report on Dingell-Johnson and Pittman-Robertson Programs for the Fiscal Year Ending June 30, 1957), 97 pp., illus., printed. Wildlife Management Institute, Wire Bldg., Washington 5, D. C.

How to Know the Freshwater Fishes, by Dr. Samuel Eddy, 259 pp., illus., printed. Wm. C. Brown Co., Dubuque, Iowa, 1957. Includes keys for identification of all the fish of the United States which are regarded as strictly fresh-water species, and also includes a number of marine species which often enter fresh water. The number of marine fish which may enter the mouth of rivers is so great that only part of them are included here. Also covers some facts about fish, such as distribution and conditions for existence, activities, and reproduction; and structure of a fish.

Wise Use of the Food Dollar--Meeting 1, Plan Before Buying; and Meeting 2, Know Your Protein Foods: Meat and Fish, by Irene H. Wolgamot, Leaflets 215 and 216, respectively, 8 pp. each, printed. Extension Service, College of Agriculture, Rutgers University, New Brunswick, N. J., October 1957. One leaflet is a guide for meal planning and buying. It discusses the importance of the four basic food groups (in which fish is included) and shows how much food is needed from each group each day for good health. It also suggests how to make the most of food by proper storage and cooking, etc. The second leaflet is a guide to buyers of meat and fish. It describes the market forms of fish, signs of freshness, how much to buy for each serving, and how to cook fish.

JAPAN:

Bulletin of Hokkaido Regional Fisheries Research Laboratory, No. 17, March 1958, 174 pp., illus., printed in Japanese with summaries in English. Hokkaido Regional Fisheries Research Laboratory, Yoichi, Hokkaido, Japan. Contains, among others, the following papers: "Studies on Larval Development and Fishery Biology of King Crab, *Paralithodes camtschatica* (Tilesius)," by Sakae Sato; "A Study of Qualities with Migratory Fish. I. Ultraviolet Absorption Spectra in Relation to the Deterioration due to the Oxidation of Oil with Mackerel Meal," by Katsutoshi Miwa, Echiko Kinoshita, and Yoshikazu Sato; "Studies on the Preservation of Marine Products--III. On the Spore-Forming Anaerobic Bacteria in Fish Canning. No. 1," by Hiroshi Oshima, Shinichiro Hagiwara, and Shoji Matumoto; and "Studies on the Preservation of Marine Products--IV. On the Spore-Forming Anaerobic Bacteria in Fish Canning. No. 2," by Hiroshi Oshima, Shinichiro Hagiwara, Masatoki Sasajima, and Motonobu Yokoseki.

LAW OF THE SEA:

Background Material on the Activities in the Organization of American States Relating to the Law of the Sea (Prepared for Submission to the United Nations Conference, Geneva, Switzerland, 1958), 47 pp., processed. Department of International Law, Pan American Union, Washington, D. C., December 1957.

LOBSTERS:

Lobster Storage, by H. J. Thomas, 20 pp., illus., printed. Her Majesty's Stationery Office, Edinburgh, Scotland, 1958. A guide to lobster storage, devoted mainly to medium and long-term storage over periods of several months, and describing the factors involved and methods adopted in the United Kingdom and elsewhere. Covers factors affecting storage--siting and construction of storage plants, water conditions, and handling of lobsters; installations--floating boxes and welled boats, pools, lobster ponds, shore-based installations, and inland storage; and marketing. A brief list of reference publications is also included.

Practical Hints for Lobster Fishermen, 16 pp., illus., printed. Her Majesty's Stationery Office, Edinburgh, Scotland, 1952. A guide to lobster fishing, containing data on the distribution of lobsters on the Scottish coasts, fishing seasons, equipment, bait, methods of operating creels, (pots), storage boxes and ponds (pounds), handling of lobsters, immature and unmarketable lobsters, packing and marketing, cooperative arrangements, scientific investigations, and information service offered by the Scottish Home Department. Packing materials recommended are wood wool, wood shavings, peat litter, and sawdust. States that seaweed should not be used as it heats up and often results in losses. Four photographic plates show two views of a lobster pot, a male lobster, and a female berried lobster. A description and life history of the lobster is included as an appendix.

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MARINE BORERS:

Marine Borer Investigations (Annual Report 1957), 36 pp., illus., processed. The Marine Laboratory, University of Miami, Coral Gables, Fla. This report presents the results of investigations conducted to develop an efficient, dependable wood preservative treatment for protection against marine borers. Creosote, which serves as an adequate wood preservative in temperate regions, is not very adequate in tropical and subtropical areas; therefore, part of the research has been devoted to the improvement of the preservative qualities of creosote. Equal effort has been devoted to the development of preservatives unrelated to creosote.

MARLINS:

On the Biology of the Atlantic Marlins, MAKAIRA AMPLA (Poey) and MAKAIRA ALBIDA (Poey), 48 pp., illus., printed, \$1. (Reprinted from Bulletin of the American Museum of Natural History, vol. 114, article 5, pp. 373-416, text figures 1-14, plates 75-82, tables 1-7.) American Museum of Natural History, New York, N. Y., March 24, 1958. Contains five separate papers, as follows: "Scales of the Atlantic Species of Makaira," by Francesca R. LaMonte; "Notes on the Alimentary, Excretory, and Reproductive Organs of Atlantic Makaira," by Francesca LaMonte; "Relative Weights of Some Viscera in the Atlantic Marlins," by Louis A. Krumholz; "Some Foods of Marlins near Bimini, Bahamas," by Louis A. Krumholz and Donald P. DeSylva; and "Juvenile Blue Marlin, Makaira ampla (Poey), from Miami, Fla., and West End, Bahamas," by Donald P. DeSylva.

MALAYA:

Report of the Fisheries Division, 1956, 30 pp., printed. Ministry of Commerce and Industry, Singapore, Malaya. Presents a general review, developments, and inventory of the fishing industry in Malaya. Statistical tables cover the number of fishermen and licensed gear or boats used by area; number of licensed fishermen by type of fishery; licensed fishing boats by type of fishery; tonnage of vessels employed; powered vessels by method of fishery; arrivals and departures of licensed fishing vessels at a central control point; fishing gear; pond cultivation; fresh fish supplies; estimated production by method of fishery; Singapore imports and exports of fresh fish; marketing; monthly average daily retail fish prices for the principal species landed; Singapore imports and exports of dried and salted fish; value of imports and exports of processed marine products; and annual average prices of producer goods used in the fishing industry. An appendix to this report summarizes the annual report on the operations of the Malayan Fisheries Loan Fund.

MUSSELS:

Forsøk med Dyrking av Blåskjell (Experimental Cultivation of Sea Mussels, *Mytilus edulis*), Fiskeridirektoratets Småskrifter Nr. 4, 18 pp., illus., printed in Norwegian. A. S. John Griegs Boktrykkeri, Bergen, Norway, 1957.

NORWAY:

Lofotfiskets lønnsomhet 1957 (Value of Lofoten Fisheries, 1957), Fiskeridirektoratets

Småskrifter Nr. 1, 41 pp., illus., printed in Norwegian. A. S. John Griegs Boktrykkeri, Bergen, Norway, 1958.

PACIFIC NORTHWEST:

Pacific Northwest Marine Fishes, 12 pp., illus., printed. State of Washington Department of Fisheries, Olympia, Wash., May 1957. Describes the most important commercial species of Pacific salmon, sole and flounder, rockfish, cod, lingcod, sea perch, halibut, smelt, the her-ring family, tuna, sablefish, sturgeon, sharks, and skates. Also presents a brief summary of salmon management problems and methods of taking fish.

PLANKTON:

Plankton of the Florida Current. IV. Factors Influencing the Vertical Distribution of Some Common Copepods, by H. B. Moore and D. L. O'Berry, Contribution No. 189, 19 pp., illus., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 7, no. 4, pp. 297-315, December 1957.) The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla.

PORTUGAL:

Estatística das Pescas Marítimas no Continente e Ilhas Adjacentes no Ano de 1955 (Statistics of Marine Fisheries of the Mainland and Adjacent Islands, 1955), 134 pp., printed in Portuguese. Comissão Central de Pescarias, Ministério da Marinha, Lisbon, Portugal, 1957. Presents statistics on landings by species, methods of catch, and area; catch of marine mammals; and vessels and gear.

Relatório do Triénio 1955-1957 (Report for the Period 1955-1957), 54 pp., processed in Portuguese. Gabinete das Estudos das Pescas, Lisbon, Portugal. Describes the technical and scientific work of the Portuguese Council for Fisheries Studies and the assistance afforded the Portuguese fishing industry during the period 1955/57.

Statistical Account of Portuguese Fisheries (Resumo Estatístico das Pescas Portuguesas), Gabinete de Estudos das Pescas Publication No. 34, 50 pp., illus., printed in Portuguese and English. Gabinete de Estudos das Pescas, Lisbon, Portugal, 1957. A summary on the actual state of the Portuguese fisheries and their development, presenting complete statistical data on the fishing industry for the period 1938-1956.

PRESERVATION:

"Preservation of Food Without Heat," by E. M. Hoshall, article, Association of Food and Drug Officials U. S. Quarterly Bulletin No. 21, 1957, pp. 200-210, printed. Baltimore District, Food and Drug Administration, Baltimore, Md.

Status Report to Management on Radiation Preservation of Food, by Colonel W. D. Jackson, PB 131171, 15 pp., illus., processed, 50 cents. Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., July 1, 1957. This document is designed to aid in analyzing the significance of the use of nuclear rays to preserve food. It describes the principal

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features of the process of radiation preservation of foods, some of the current obstacles to full utilization of the process, history of the radiation preservation process, and the current state of radiation preservation. It also tells what the successful development of the process can do for the farmer, grain broker, food processor, Public Health Officer, military logistician, grocer, consumer and housewife, and instrument manufacturer; what the various organizations in this country are doing in research on the irradiation of food; what other governments are doing; and what our government is doing. It also discusses regulations and licensing; patent structure and its application; and the effect the adoption of radiation preservation methods may have on employees, union, stockholders, and customers. A schematic drawing of the United States Army Ionizing Radiation Center is also included.

RED TIDE:

The Relationship of Total Phosphorus Concentration Sea Water to Red Tide Blooms, by Selwyn Jack Bein, Contribution No. 184, 14 pp., illus., printed. (Reprinted from *Bulletin of Marine Science of the Gulf and Caribbean*, vol. 7, no. 4, December 1957, pp. 316-329.) The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla.

SALMON:

The Salmon Crisis, 12 pp., illus., printed. Washington Department of Fisheries, 4015 20th Ave. W., Seattle 99, Wash., August 1954. Briefly presents a report on the environmental changes to which a drastic depletion of the salmon resources of Washington may be attributed. Also describes salmon rehabilitation activities of the Washington Department of Fisheries.

Statistics on Salmon Sport Fishing in the Tidal Waters of British Columbia, 1957, 19 pp., text, 2 pp., maps, processed. Department of Fisheries of Canada, 1110 West Georgia Street, Vancouver 5, B. C., Canada, May 16, 1958. Presents British Columbia's commercial and sport catch of salmon by species for 1953-57, commercial catch of troll-caught salmon, and summary of sport fishing catches by area.

Salmon Rehabilitation and Hatcheries--Activities and Accomplishments, 12 pp., illus., printed. Washington State Department of Fisheries, Olympia, Wash., January 1958. A brief report containing facts about salmon; the role of hatcheries; a description of original experiment stations; developments in artificial propagation; summary of the Pacific salmon family; hatching methods and accomplishment of hatcheries; over-all rehabilitation objectives; and locations of hatcheries in Washington.

SCOTLAND:

Report on the Fisheries of Scotland, 1957, 68 pp., printed. Her Majesty's Stationery Office, 13A Castle Street, Edinburgh 2, Scotland, April 1958. A report, containing many statistical tables, which covers the means of capture and number of persons engaged in Scottish fisheries; herring, white fish, shellfish, and salmon

fisheries; byproducts production; fishery regulations; scientific investigations; and harbor studies and improvements. Contains various appendices which present supplemental data on the above-mentioned subjects.

SEA LAMPREY:

"The Sea Lamprey and the Death of the Great Lakes Lake Trout Fishery", by Edmund K. Swigart, article, *Yale Conservation Studies*, vol. 4, printed. Yale Conservation Club, New Haven, Conn. A brief account of the alarming influx of the sea lamprey through the Great Lakes and the consequent toll of the lake trout, which had provided one of the most profitable fisheries of the region. The article outlines the plan of campaign for the elimination of the lamprey, including the search for a larvicide which could destroy either the larvae or the young adults drifting back from the streams where they have spawned to the lakes. The plan, international in scope because Canada is affected as well as the United States, calls for the eventual reintroduction of lake trout and other species under attack to a full capacity as quickly and as economically as possible. The author says that if the lamprey is not the sole cause of the fisheries decrease, it is at least one of the major two or three factors and must be controlled before any optimistic view of the return of this lucrative industry can be formulated.

SEALS:

"Canada's Atlantic Sealfishery", by Bruce Woodland, article, *Trade News*, vol. 10, no. 8, February 1958, pp. 3-8, illus., printed. Department of Fisheries of Canada, Ottawa, Canada. Two articles on Canada's Atlantic sea fishery. The first article describes the decline of sealing operations in Newfoundland, the traditional home of the seal hunt. The second article, entitled "Halifax Now Main Centre," by G. J. Gillespie, contains a report on sealing out of the port of Halifax. A brief history of the Atlantic seal fishery is given, along with present operations, and prospects for future sealing operations.

SHARKS:

"A Review of the Eastern Pacific Sharks of the Genus *Carcharhinus*, with a Redescription of *C. malpeloensis* (Fowler) and California Records of *C. remotus* (Dumeril)", by Richard H. Rosenblatt and Wayne J. Baldwin, article, *California Fish and Game*, vol. 44, no. 2, April 1958, pp. 137-159, illus., printed, single copy 75 cents. Printing Division, Documents Section, California Department of Fish and Game, Sacramento 14, Calif.

SHRIMP:

The Use of Sodium Bisulfite for the Control of Black Spot in Shrimp, by C. Isaac Camber, Mary H. Vance, and James E. Alexander, Technical Series No. 20, 19 pp., illus., printed. The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla., December 1957. Results of work which was undertaken to determine the optimum concentration and exposure time of a sodium bisulfite sea-water dip for preventing the development of black spot in pink

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shrimp. It was found that sodium bisulfite applied as a 1 1/4-percent dip for one minute was effective in reducing the incidence of black spot in shrimp for at least 10 days of iced storage. When used at this level, no detrimental effects on the flavor, odor, toughness, nor bacterial counts of treated shrimp were observed. Sulfur dioxide residuals were less than 10 parts per million, and no evidence of thiamine destruction was noted. Full benefits from the use of the chemical will not be obtained unless quick and careful handling procedures are followed. Using too much of the chemical or dipping the shrimp too long in the sodium bisulfite solution may cause a slight sharp or acid taste which would render them less desirable to the buyer.

SNOOK:

A Survey of the Snook Fishery of Florida, with Studies of the Biology of the Principal Species, CENTROPOMUS UNDECIMALIS (Bloch), by Arthur R. Marshall, Technical Series No. 22, 39 pp., illus., printed. The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla., March 1958. The results of a survey, conducted from April 1954 to May 1955, which was undertaken to obtain a description of the snook fishery of Florida, in which the dominant species is *Centropomus undecimalis* (Bloch), and to determine certain aspects of the biology of that fish. It includes discussions of the fishery; biology, geographic range, and aspects of the life history of *Centropomus undecimalis*; and ecological considerations. The author states that "Although snook have been caught in Florida by sport fishermen for many years, a steady commercial fishery for them has existed only since about 1930. Sport and commercial fishing activities are confined generally to the southern half of the State. Brackish water mangrove areas produce the bulk of the catch, though a low percentage comes from fresh waters. The commercial fishery ranks about 15th in dollar value among the State's food-fish fisheries, with an annual value estimated at \$75,000, and annual production of 1/2 million pounds or more. Commercial production for the period 1941 to 1955 reached its highest peak in 1948, at 800,000 pounds, when the snook seine was in use and price was high. A decline since 1948 has occurred, possibly because of lessening market demand for fresh fish." This report was prepared in 1956. In 1957 the Florida State Legislature enacted a law prohibiting the sale of snook. Consequently all references to commercial fishing for snook apply to the situation prior to this legislative action.

TERRITORIAL WATERS:

Laws and Regulations on the Regime of the Territorial Sea, ST/LEG/SER.E/6 (UN Legislative Series, Sales No. 1957, V.2), 811 pp., printed, \$7. United Nations, New York, N. Y., November 1957.

TIDES:

Tide Tables--West Coast, North and South America (including the Hawaiian Islands), 1958, 222 pp., printed, 50 cents. U. S. Department of Commerce, Coast and Geodetic Survey, Washington 25, D. C. This publication contains tables on daily tide predictions for 188 reference ports, tidal differences and other constants for about 5,000 stations, approximate height of tide at any time, local mean time of sunrise and sunset, reduction of local mean time to standard time, moonrise and moonset, and astronomical data. Explanatory notes to facilitate usage of each table are included. Also, contains a list of Coast and Geodetic Survey publications relating to tides and tidal currents.

TRADE AGREEMENTS:

"How a Trade Agreement is Made," by Honoré M. Catudal, Department of State Publication 6615, Commercial Policy Series 165, 6 pp., illus., printed, 5 cents, Department of State, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A step-by-step account of the manner in which a trade agreement is negotiated. Background information is presented on trade agreements legislation, interdepartmental organization, and preparatory procedure.

TUNA:

Tuna Fish (Report on Investigation Conducted Pursuant to a Resolution by the Committee on Finance of the United States Senate dated August 20, 1957), 180 pp., processed. United States Tariff Commission, Washington 25, D. C. This is a report of the results of an investigation on tuna made in response to a resolution of the Committee on Finance of the Senate adopted August 20, 1957. The investigation was made pursuant to section 332 of the Tariff Act of 1930, as amended, and was similar in scope to a previous investigation made by the U. S. Tariff Commission in response to a resolution of the Committee adopted June 26, 1952. This report discusses the consumption of tuna in the United States in recent years; gives general information on the domestic tuna fishery, and detailed information on the operations of the bait-boat, purse-seine, and albacore fishing fleets; discusses at some length the operations of the domestic tuna-canning industry; and gives information on a number of other subjects, including tariff rates, tuna imports, and the tuna fisheries of Japan and Peru.

WASHINGTON:

Washington State Shellfish, 8 pp., illus., printed. Washington State Department of Fisheries, Olympia, Wash., January 1957. This leaflet briefly covers Washington's most important commercial species of oysters, clams, and shrimp.

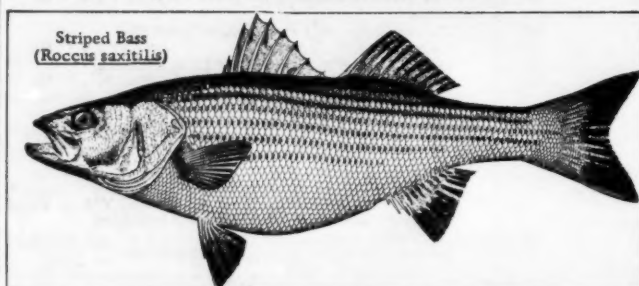


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STRIPED BASS

Fishery Leaflet No. 451 (Striped Bass) contains a short description of the striped bass and its importance as a sport and commercial fish. It describes its relationships, geographical distribution, races, introduction into California, migrations, reproduction, rate of growth, and conservation problem.



Striped Bass
(*Morone saxatilis*)

The striped bass, or rockfish as it is called from Maryland southward, is a popular and valuable food and game fish of the Atlantic and Pacific coasts. Its meat is firm, flaky, and of excellent flavor. Along the Atlantic coast, it supports extensive commercial and recreational fisheries, yielding more than 5 million

pounds annually to market fishermen and about the same amount to sport fishermen. The commercial fishery is centered in Maryland, Virginia, and North Carolina. The sport fishery is active in the Chesapeake Bay region and in the coastal areas of New Jersey, New York, and New England.

In California, from 1946 to 1953, 1,380,000 to 1,750,000 pounds of striped bass were taken annually by 113,000 to 166,000 anglers. In 1953, a study by California biologists valued the State's striped bass sport fishery at \$18 million, based on an average expenditure of \$9.00 per-angler-day.

Recreational fishing areas, such as those in the western quarters of Long Island Sound and in the Santee and Cooper Reservoirs of South Carolina, are very popular. On the basis of a creel census of 1 year's fishing, the Cooper Reservoir yielded 64,000 striped bass weighing 0.5 million pounds.

In Coos Bay, Ore., the first striped bass were taken in 1914, and at present this species supports important commercial and sport fisheries.

Copies of Fishery Leaflet No. 451 (6 pages) are available free from the Division of Information, U. S. Fish and Wildlife Service, Washington 25, D. C.

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